



TITLE:

# The Papers Published by the Staff Members of the Institute from July 1987 to June 1988

AUTHOR(S):

---

CITATION:

The Papers Published by the Staff Members of the Institute from July 1987 to June 1988.  
Bulletin of the Institute for Chemical Research, Kyoto University 1989, 66(6): 631-663

ISSUE DATE:

1989-03-22

URL:

<http://hdl.handle.net/2433/77281>

RIGHT:

## The Papers Published by the Staff Members of the Institute from July 1987 to June 1988

### Nuclear Chemistry

Superconducting Transition of  $\text{La}_{1.9}\text{Sr}_{0.1}\text{CuO}_{4-x}$ , H. Mazaki, M. Takano, Z. Hiroi, Y. Bando, R. Kanno, Y. Takeda, and O. Yamamoto, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 147, (1987).

Superconducting Transition of Thin V Films Sandwiched in between Amorphous Si Layers, H. Mazaki, K. Kanoda, T. Mizutani, Y. Hosoi, and T. Shinjo, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 159, (1987).

Complex Susceptibility of High- $T_c$  Superconductor  $\text{ErBa}_2\text{Cu}_3\text{O}_{6+x}$ , T. Ishida and H. Mazaki, *Jpn. J. Appl. Phys.*, **27**, L1296, (1987).

Superconducting Fluctuations and Transition Temperature of Ultrathin V Films and V-Si Multilayered Systems, K. Kanoda, H. Mazaki, T. Mizutani, N. Hosoi, and T. Shinjo, *Jpn. J. Appl. Phys. Supplement* 26-3, **26**, 1433, (1987).

Superconductivity in V/Si Multilayered Films, N. Hosoi, T. Mizutani, K. Ohhashi, K. Kanoda, H. Mazaki, and T. Shinjo, *Jpn. J. Appl. Phys. Supplement* 26-3, **26**, 1435, (1987).

Bulk Nature of High- $T_c$  Superconductivity in  $\text{ErBa}_2\text{Cu}_3\text{O}_{6+x}$ , H. Mazaki and T. Ishida, *Jpn. J. Appl. Phys.*, **26**, L1508, (1987).

Complex Susceptibility of  $\text{YBa}_2\text{Cu}_3\text{O}_{6.86}$ , H. Mazaki, M. Takano, Y. Ikeda, Y. Bando, R. Kanno, Y. Takeda, and O. Yamamoto, *Jpn. J. Appl. Phys.*, **26**, L1749, (1987).

Superconducting Transition of  $\text{GdBa}_2\text{Cu}_3\text{O}_{7-x}$ , H. Mazaki, M. Takano, R. Kanno, and Y. Takeda, *Jpn. J. Appl. Phys.*, **26**, L1752, (1987).

Properties of Grain Boundary of Sintered  $\text{Ba}_2\text{YCu}_3\text{O}_x$  in terms of Complex Susceptibility, H. Mazaki, M. Takano, Y. Ikeda, Y. Bando, Y. Takeda, and R. Kanno, *J. Jpn. Soc. Powder and Powder Metallurgy*, **34**, 620, (1987), in Japanese.

London Penetration Depth of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ , T. Ishida and H. Mazaki, *Jpn. J. Appl. Phys.*, **26**, L2003, (1987).

Superconducting Transition of  $\text{ErBa}_2\text{Cu}_3\text{O}_{6+x}$ , H. Mazaki and T. Ishida, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 211, (1987).

Superconducting Transition of  $\text{RBa}_2\text{Cu}_3\text{O}_{7-x}$  (R: Y, Gd), H. Mazaki, Z. Hiroi,

M. Takano, Y. Bando, R. Kanno, Y. Takeda, and O. Yamamoto, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 219, (1987).

Single-Crystal  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Thin Films by Activated Reactive Evaporation, T. Terashima, K. Iijima, K. Yamamoto, Y. Bando, and H. Mazaki, *Jpn. J. Appl. Phys.*, **27**, L91, (1988).

Magnetic Field Penetration into  $\text{La}_{1.85}\text{Sr}_{0.15}\text{CuO}_4$ , T. Ishida and H. Mazaki, *Jpn. J. Appl. Phys.*, **27**, L199, (1988).

Single Crystal  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Thin Films by Activated Reactive Evaporation, Y. Bando, T. Terashima, K. Iijima, K. Yamamoto, and H. Mazaki, *Physica C*, **153-155**, 810, (1988).

$\text{RBa}_2\text{Cu}_3(1-x)\text{Fe}_x\text{O}_y$ : Microstructure and Superconductivity, M. Takano, Z. Hiroi, H. Mazaki, Y. Bando, Y. Takeda, and R. Kanno, *Physica C*, **153-155**, 860, (1988).

Superconducting Properties of  $\text{GdBa}_2(\text{Cu}_{1-x}\text{Fe}_x)_3\text{O}_y$  ( $x \leq 0.04$ ), M. Takano, H. Mazaki, Z. Hiroi, Y. Bando, Y. Takeda, and O. Yamamoto, *J. Ceram. Soc. Jpn. Inter. Ed.*, **96**, 398, (1988).

Complex Susceptibility of the Oxide Superconductor  $\text{BiSrCaCu}_2\text{O}_x$ , T. Ishida and H. Mazaki, *Jpn. J. Appl. Phys.*, **27**, L531, (1988).

Two-Step Superconducting Transition of a Bi-Sr-Ca-Cu-O System, H. Mazaki, T. Ishida, and T. Sakuma, *Jpn. J. Appl. Phys.*, **27**, L811, (1988).

$L_{\alpha}$  X-ray Emission in Heavy-ion Bombardment of Bi, S. Ito, M. Shoji, N. Maeda, R. Katano, T. Mukoyama, R. Ono and Y. Nakayama, *J. Phys. B: At. Mol. Phys.*, **20**, L597, (1987).

Proportional Counters for Low and High Temperature Uses, Y. Isozumi, T. Fujii, R. Katano and S. Kishimoto, *Radiation Detectors and Their Uses*, KEK Report 88-5, 103, (1988).

Production of Multiply Charged Ions by 4.1-8.0 keV Photon Impact—Charge Distribution and Mean Charge of Xe Ions—, H. Tawara, T. Mukoyama, T. Tonuma, T. Koizumi, T. Matsuo, H. Shibata, K. Shima, and A. Yagishita, *Electronic and Atomic Collisions*, Abst. of Contributed Papers, XV ICPEAC, Brighton, 1987, ed. by J. Geddes et al. (Northe-Holland, Amsterdam, 1988), p. 7

Coupled-states Model Calculations of L-Subshell Ionisation Probabilities for Ne on Yb, Pt Collisions, L. Sarkadi and T. Mukoyama, *J. Phys. B: At. Mol. Phys.*, **20**, L557, (1987).

Charge Distribution of Xe Ions as a Result of Multiple Photoionisation of Xe Atoms Between 4.1 and 8.0 keV, T. Mukoyama, T. Tonuma, A. Yagishita, H. Shibata,

T. Koizumi, T. Matsuo, K. Shima, and H. Tawara, *J. Phys. B: At. Mol. Phys.*, **20**, 4453, (1987).

Atomic Excitation as the Result of Inner-shell Vacancy Production, T. Mukoyama and K. Taniguchi, *Phys. Rev. A*, **36**, 693, (1987).

Finite-base-set Expansion Method for Inner-shell Ionization in Ion-atom Collisions, T. Mukoyama and C.-D. Lin, *Nucl. Instr. and Meth.*, **A262**, 15, (1987).

Energy Shifts and Transition Probabilities of  $L_{\gamma}$  x rays from Bismuth with Multiple N Vacancies, T. Mukoyama and S. Ito, *Bull. Inst. Chem. Res., Kyoto Univ.*, **64**, 163, (1987).

Basis-set Expansion of the Dirac Equation for Atoms, T. Mukoyama and C.-D. Lin, *J. de Phys.*, **48**, C9-523, (1987).

Electronic Structures of Muonic Atoms and Molecules, H. Adachi and T. Mukoyama, *J. de Phys.*, **48**, C9-733, (1987).

Chemical Effects on K-x-ray Spectrum, K. Taniguchi, T. Mukoyama, and H. Adachi, *J. de Phys.*, **48**, C9-757, (1987).

Multiply Charged Xe Ions Produced in 4.1-8.0 keV x-Rays, T. Tonuma, A. Yagishita, H. Shibata, T. Koizumi, T. Matsuo, K. Shima, T. Mukoyama, and H. Tawara, Photon Factory Activity Report #5 1987 (National Laboratory for High Energy Physics, Tsukuba, 1988) p. 265

Nuclear Excitation by Synchrotron Radiation, T. Mukoyama, H. Kaji, K. Yoshihara, T. Nakajima, and H. Kobayakawa, Photon Factory Activity Report #5 1987 (National Laboratory for High Energy Physics, Tsukuba, 1988), p. 322.

Finite-basis-set Expansion Method for Inner-shell Ionization in Ion-atom Collisions, T. Mukoyama and C.-D. Lin, Lecture Notes in Physics, No. 294, High-Energy Ion-Atom Collisions, ed. by D. Berényi and G. Hock (Springer, Berlin, 1988), p. 84.

Relativistic Coulomb Continuum Wave Functions at Zero Kinetic Energy in Ion-atom Collisions, T. Mukoyama and L. Sarkadi, *Bull. Inst. Chem. Res., Kyoto Univ.*, **66**, 11, (1988).

Subshell Coupling Effects in L-shell Ionization of Gold by Proton Impact, L. Sarkadi and T. Mukoyama, *Phys. Rev. A*, **37**, 4540, (1988).

Multiple Scattering Effect for Quasifree Scattering in the  $^3\text{He}(p, pp) ^2\text{H}$  Reaction at 64.8 MeV, S. Kakigi, K. Fukunaga, T. Ohsawa, A. Okihana, T. Sekioka, H. Nakamura-Yokota, S. Tanaka and S. Kato, *Nuclear Physics A*, **A473**, 31-39, (1987).

Operation of Helium-Filled Proportional Counter at Low Temperatures (4.2-295 K), J. Kishimoto, Y. Isozumi, R. Katano and H. Takekoshi, *Nuclear Instruments and Methods in Physics Research A*, **A262**, 413-418, (1987).

Double Scattering Measurement Applied Heavy Ion Elastic Scattering at Intermediate Energies, M. Tanaka, T. Yamagata, S. Nakayama, M. Inoue, K. Goto, K. Katori, M. Yanagi and H. Ogata, *Nuclear Instruments and Methods in Physics Research A*, **A267**, 139–143, (1988).

Isovector Giant Resonances in Light Nuclei Observed by ( $^7\text{Li}$ ,  $^7\text{Be}$ ) reaction, S. Nakayama, T. Yamagata, K. Yuasa, M. Tanaka, M. Inoue, T. Itahashi and H. Ogata, *Physics Letters B*, **B195-3**, 316–320, (1987).

Three-Body Breakup Reaction in FSI Region, K. Fukunaga, S. Kakigi, T. Ohsawa, A. Okihana and T. Sekioka, *Journal of the Physical Society of Japan*, **56-7**, 2357–2362, (1987).

Fine Structure of Resonance at  $E_x \sim 14$  MeV in  $^{40}\text{Ca}$ , T. Yamagata, S. Kishimoto, K. Iwamoto, B. Saeki, K. Yuasa, M. Tanaka, K. Ogino, S. Matsuki, T. Fukuda, M. Inoue, K. Hosono, A. Shimizu, N. Matsuoka, I. Miura, Y. Ikku, and H. Ogata, *Physical Review C*, **36-2**, 573–576, (1987).

Observation of Vector Analyzing Power in Elastic Scattering of 150-MeV  $^6\text{Li}$  on  $^{12}\text{C}$ , M. Tanaka, T. Yamagata, S. Nakayama, M. Inoue, Y. Sakuragi, M. Kamimura, K. Goto, K. Katori, M. Yanaga and H. Ogata, *Physical Review C*, **36-5**, 2146–2149, (1987).

Proton RFQ Linac of Kyoto Univ., M. Sawamura, H. Okamoto, Y. Iwashita, K. Fukunaga, M. Inoue and H. Takekoshi, Proceedings of the 12th Linear Accelerator Meeting in Japan, Aug. 24–26 (1987), 19–21, (1987), in Japanese.

Construction of an RFQ Linac, M. Inoue, K. Fukunaga, S. Kakigi, T. Ohsawa, Y. Iwashita, H. Fujita, M. Sawamura, H. Okamoto, S. Takama and H. Takekoshi, Proceedings of the Third JAPAN-CHINA Joint Symposium on Accelerators for Nuclear Science and their Applications, 18–20 Nov. 1987, 64–66, (1987).

Computation of the Effective Solid Angle for Gas Scattering Experiment, T. Sekioka, K. Fukunaga, S. Kakigi, T. Ohsawa and A. Okihana, *Bulletin of the Institute for Chemical Research, Kyoto University*, **66-1**, 1–10, (1988).

Proton Storage Ring for the ICR Linac, M. Inoue, *Bulletin of the Institute for Chemical Research, Kyoto University*, **66-1**, 19–21, (1988).

Continuum Spectra of Deuterons for the  $p+^3\text{He}$  Reaction at 65 MeV, A. Okihana, K. Fukunaga, S. Kakigi, T. Ohsawa, T. Sekioka, H. Yokota and R. Takashima, *Bulletin of the Institute for Chemical Research, Kyoto University*, **66-1**, 22–28, (1988).

RF Characteristics of 433.3-MHz Proton RFQ Linac, M. Sawamura, H. Okamoto, Y. Iwashita, K. Fukunaga, M. Inoue and H. Takekoshi, *Bulletin of the Institute for Chemical Research, Kyoto University*, **66-1**, 29–37, (1988).

Design of 433.3 MHz Alvarez Drift Tube Linac and Beam Matching Section, M. Sawamura, H. Okamoto, Y. Iwashita, K. Fukunaga, M. Inoue and H. Takekoshi, *Bulletin of the Institute for Chemical Research, Kyoto University*, **66-1**, 38-43, (1988).

RF Power Source of Kyoto University Proton Linac, Y. Iwashita, KEK Report, (Proceedings of the Meeting on High-Power, High-Frequency Power Sources, June 4-5, 1987, KEK), **87-13**, 65-69, (1987), in Japanese.

High-Precision Nuclear Spectroscopy with Laser, S. Matsuki, Nihon Butsuri Gakkai-shi, **43**, 136-144, (1988), in Japanese.

Nuclear Polarization of Unstable  $^{170}\text{Tm}$  in  $\text{Tm}^{2+}:\text{SrF}_2$  with  $\beta$ -ray Radiation-Detected Optical Pumping in Solids, K. Shimomura, S. Matsuki, S. Uemura, T. Kohmoto, Y. Fukuda and T. Hashi, Technical Digest of International Conference on Quantum Electronics, 18-21 July 1988, Tokyo, Japan, 298-299, (1988).

### Physical Chemistry

Molecular Orientation in Thin Organic Films, T. Takenaka, *Kagaku to Kogyo* (Chemistry and Industry), **40**, 822, (1987), in Japanese.

Fourier Transform Infrared-Attenuated Total Reflection Spectra of Stearic Acid LB Films with 1-9 Monolayers and Intensity Enhancement by Evaporated Metal Films, T. Takenaka, *Maku (Membrane)*, **12**, 379, (1987), in Japanese.

Intensity Enhancement of Infrared Attenuated Total Reflection Spectra of Stearic Acid Langmuir-Blodgett Monolayers with evaporated Silver Island Films, T. Kamata, A. Kato, J. Umemura and T. Takenaka, *Langmuir*, **3**, 1150, (1987).

Infrared ATR Spectra of Stearic Acid LB Films : Intensity Enhancement by Au Evaporation, T. Kamata, J. Umemura and T. Takenaka, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 170, (1987).

Intensity Enhancement in Infrared ATR Spectra of 1-Monolayer LB Films of Stearic Acid by Various Evaporated Metal Films, T. Kamata, J. Umemura and T. Takenaka, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 179, (1987).

A Study of Hydrogen-Bond Dynamics in Carboxylic Acids by NMR  $T_1$  Measurements: Isotope Effects and Hydrogen-Bond Length Dependence, T. Agaki, F. Imashiro, T. Terao, N. Hirota and S. Hayashi, *Chem. Phys. Letters*, **139**, 331, (1987).

Fourier Transform Infrared Study on the Phase Transitions of a 1, 2-Bis(Myristoylamido)-1, 2-deoxyphosphatidylcholine—Water System, T. Kawai, J. Umemura, T. Takenaka, M. Gotou and J. Sunamoto, *Langmuir*, **4**, 449, (1988).

pH Dependence of Ultraviolet-Visible Absorption and Resonance Raman Spectra of an Aqueous Solution of an Azobenzene-Containing Ammonium Amphiphile, Y. Tian, N. Isono, T. Kawai, J. Umemura, T. Takenaka and T. Kunitake, *Langmuir*, **4**,

693, (1988).

Adsorption of Transfer Ribonucleic Acid on a Stationary Mercury Electrode, M. K. Kaisheva, M. Matsumoto, Y. Kita and T. Takenaka, *Langmuir*, **4**, 762, (1988).

Ultraviolet-Visible Absorption and Resonance Raman Spectra of Azobenzene-Containing Amphiphile Monolayers Adsorbed at the Acidic Aqueous Solution/Carbon Tetrachloride Interface, Y. Tian, J. Umemura and T. Takenaka, *Langmuir*, **4**, 1064, (1988).

Structure Study of Langmuir-Blodgett Films of Stearic Acid and Cadmium Stearate Deposited by Different Techniques, T. Kamata, J. Umemura and T. Takenaka, *Chem. Letters*, 1231, (1988).

Quantitative Studies of Molecular Orientation in LB Films by FT-IR Transmission and Reflection-Absorption Spectroscopy, T. Takenaka, J. Umemura and T. Kawai, International Symposium on the Current Problems and Possibilities for the Future of Organized Molecular Assemblies at Interface, 2, (1988).

Surface Enhanced Raman Scattering of Cetyl Orange LB Monolayers, T. Takenaka, J. Umemura and T. Nakagawa, 6th International Conference on Surface and Colloid Science, **1C03**, 168, (1988).

Surfactant Monolayers on Mercury, M. Matsumoto, T. Takenaka, H. Yoshimura and K. Nagayama, 6th International Conference on Surface and Colloid Science, **2B06**, 123, (1988).

Molecular Orientation in Spiropyran LB Films, J. Hibino, E. Ando, K. Morimoto, J. Umemura and T. Takenaka, 6th International Conference on Surface and Colloid Science, **4B11**, 151, (1988).

Molecular Orientation in Azobenzene-Containing Amphiphile LB Films as Studied by FT-IR and UV-VIS Spectroscopy, J. Umemura, T. Kawai and T. Takenaka, 6th International Conference on Surface and Colloid Science, **4E33**, 447, (1988).

Characterization of LB Films by FT-IR Spectroscopy, J. Umemura, *Hyomen (Surface)*, **26**, 180, (1988), in Japanese.

Molecular Dynamics Simulation of Infrared Spectra and Average Structure of Benzoic Acid Crystal, R. Nakamura, K. Machida, M. Oobatake and S. Hayashi, *Molecular Phys.*, **64**, 215, (1988).

Structure and Defects of a Linear Chain Polymer Film; GeO Phthalocyanine Epitaxially grown on KCl, T. Kobayashi and N. Uyeda, *Journal of Crystal Growth*, **84**, 589-597, (1987).

Structure of Iodine-doped poly-GeO-Phthalocyanine Epitaxial Film and Its Lattice Defects Studied by Direct Atom Imaging, T. Kobayashi and N. Uyeda, *Philosophical Magazine B*, **57**, 493-504, (1988).

High Resolution Electron Microscopic Study of Photolytic Silver in Silver Bromide, T. Shizawa and T. Kobayashi, *Physika Status Solidi*, **104**, 649–659, (1987).

Orientation Dependence of the Carbon-K-Edge in the Electron Energy Loss Spectra of a Potassium-Benzene-Graphite Intercalation Compound, H. Kurata, K. Ishizuka, T. Kobayashi and N. Uyeda, *Synthetic Metals*, **22**, 337–348, (1988).

Structure of Metal -Free Phthalocyanine Stabilized by the Addition of Its 4-Chloro Derivative, K. Yase, N. Yasuoka, T. Kobayashi and N. Uyeda, *Acta Crystallographica C*, **44**, 514–516, (1988).

Lattice Defects in Organic Crystals, T. Kobayashi, *Denshi-Kenbikyo*, **22**, 202–209, (1988), in Japanese.

Image Formation Theory of High Resolution Electron Microscope, K. Ishizuka, *Denshi Kenbikyo*, **22**, 86–94, (1987), in Japanese.

Dynamical Theory of High Energy Electron Diffraction—Physical Optics Approach—, K. Ishizuka, *Journal of the Crystallographic Society of Japan*, **29**, 209–224, (1987), in Japanese.

Analysis of Dielectric Observations of KCl-charged poly(methyl methacrylate) Microcapsuled Using a Two-component Model Consisting of KCl-permeable and KCl-Impermeable Capsules, K. Sekine, *Colloid & Polymer Science*, **265**, 1054–1060, (1987).

Dipole of Centrosymmetric Dimer of Fatty Acid: Limitation of the Vector Sum Law, Y. Kita, *The Journal of Physical Chemistry*, **91**, 4206, (1987).

Adsorption of Transfer Ribonucleic Acid on a Stationary Mercury Electrode, M. K. Kaisheva, M. Matsumoto, Y. Kita and T. Takenaka, *LANGMUIR*, **4**, 762, (1988).

Effects of Absorbed Benzene on Relaxation Behavior of Polytrifluoroethylene, Y. Murata, *Polymer Journal*, **20**, 251, (1988).

Elastic Modulus for Copolymer of Vinylidene Fluoride and Trifluoroethylene, Y. Murata and N. Koizumi, Reports on Progress in Polymer Physics in Japan, **30**, 363, (1987).

Pressure Dependence of Polarization Reversal in Vinylidene Fluoride-Trifluoroethylene Copolymers, N. Koizumi and Y. Murata, Reports on Progress in Polymer Physics in Japan, **30**, 467, (1987).

Physico-Chemical Properties of Emulsions I., Electro-Chemical Properties, T. Hanai, Emulsification-Dispersion Technology Handbook, edited by Koishi, Science Forum, in Japanese, 65, (1987).

Determination of Electrical Admittances of Biological Cells, S. Takashima, K. Asami and R. E. Yantorno, J. Electrostatics; A special Issue dedicated to the Memory



of Herbert Pohl. **123**, 567, (1988).

### Analytical and Inorganic Chemistry

Voltanmetry for the Ion Transfer at the Interface of Two Immiscible Electrolyte Solutions, Z. Yoshida and S. Kihara, *Bunseki*, **7**, 472-479, (1987), in Japanese.

Solvent Extraction of Lithium and Sodium with 4-Bezoyl of 4-Perfluoroacyl-5-Pyrazolone and TOPO, S. Umetani, K. Maeda, S. Kihara and M. Matsui, *Talanta*, **34**, 779-782, (1987).

Tungsten in North Pacific Waters, Y. Sohrin, K. Isshiki, T. Kuwamoto and E. Nakayama, *Marine Chemistry*, **22**, 95-103, (1987).

Mixed-Ligand Chelate Extraction of Lanthandes with 1-Phenyl-3-methyl-4-(trifluoroacetyl)-5-pyrazolone and Some Phosphine Oxide Compounds, S. Umetani and H. Freiser, *Inofg. Chem. 1987*, **26**, 3179-3181, (1987).

Voltammetry for the Charge Transfer at the Liquid/Liquid Interface, S. Kihara, M. Suzuki, Z. Yoshida and M. Matsui, *Proceedings of The Second Japan-Korea Joint Symposium on Analytical Chemistry*, **11**, 41-48, (1987).

Simultaneous Multi-Element Extraction with High Efficiency by Dithizone and Other Ligands, M. Sugiyama, H. Mukai, N. Yasuda, S. Kihara and M. Matsui, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 197-204, (1987).

Solvent Extraction of Hydrochloric and Perchloric Acids from Diethylene Glycol Solution with TOPO in Decaline, Y. Nakai, T. Aoki, S. Miyazaki, S. Kihara and M. Matsui, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 205-210, (1987).

Distribution and Determination of Manganese in Clam Shell by Graphite Furnace-Atomic Absorption Spectrometry and Neutron Activation Analysis, O. Fujino, M. Matsui, T. Nagahiro, Y. Nakaguchi, and K. Hiraki, *Journal of the Chemical Society of Japan*, **2**, 153-156, (1988), in Japanese.

Electrolytic Preparation of a Reduced Ninhydrin Reagent for Amino Acid Analysis, T. Hori and S. Kihara, *Fresenius Z. Anal. Chem.*, **330**, 627-630, (1988).

A Simulation of Bromate-Cerium-Oxalic Acid Oscillations, Y. Sasaki, *Bull. Chem. Soc. Jpn.*, **61**, 1479-1483, (1988).

Flow Properties and Fiber Formation of Alumina Sols, T. Maki and S. Sakka, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 242-251, (1987).

Preparation of Alumina Fibers by Sol-Gel Method, T. Maki and S. Sakka, *J. Non-Crystal. Solids*, **100**, 303-308, (1988).

Raman Spectroscopic Study of the Structure of BaO-YO<sub>1.5</sub>-SiO<sub>2</sub> and BaO-

LaO<sub>1.5</sub>-SiO<sub>2</sub> Glasses, H. Kozuka, Y. Li, K. Fukumi and S. Sakka, *J. Mater. Sci. Lett.*, **6**, 267-270, (1987).

Formation and Properties of BaO-YO<sub>1.5</sub>-SiO<sub>2</sub> and BaO-LaO<sub>1.5</sub>-SiO<sub>2</sub> Glasses, Y. Li, H. Kozuka and S. Sakka, *Yogyo-Kyokai-Shi*, **95**, 538-544, (1987), in Japanese.

Fiber Drawing from Silicon Alkoxide Solutions in the Sol-Gel Process, S. Sakka and H. Kozuka, *Chem. Lett.*, **1987**, 1763-1766, (1987).

Formation of Highly Porous Opaque Gel from Alkoxysilane Solutions, H. Kozuka and S. Sakka, *Chem. Lett.*, **1987**, 1791-1794, (1987).

Viscosity Behavior of Silicon Alkoxide Solutions in Sol-Gel Transformation, H. Kozuka, H. Kuroki and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 1181-1188, (1987).

Flow Characteristics and Spinnability of Sols Prepared from Silicon Aldoxide Solution, H. Kozuka, H. Kuroki and S. Sakka, *J. Non-Crystal. Solids*, **100**, 226-230, (1988).

The Change of Flow Characteristics of Si(OC<sub>2</sub>H<sub>5</sub>)<sub>4</sub> Solutions in the Course of Sol-to-Gel Conversion, H. Kozuka, H. Kuroki and S. Sakka, *J. Non-Crystal. Solids*, **101**, 120-122, (1988).

Superconducting Oxide Thin Films Prepared by Sol-Gel Technique Using Metal Alkoxides, T. Monde, H. Kozuka and S. Sakka, *Chem. Lett.*, **1987**, 287-290, (1988).

Formation of Superconducting YBa<sub>2</sub>Cu<sub>3</sub>O<sub>y</sub> through Sol-Gel Method, H. Kozuka, T. Umeda, J. S. Jin, F. Miyaji and S. Sakka, *J. Ceram. Soc. Jpn.*, **96**, 355-59, (1988).

Fabrication of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>y</sub> Fibers through Sol-Gel Method, S. Sakka, H. Kozuka and T. Umeda, *J. Ceram. Soc. Jpn.*, **96**, 468-70, (1988).

Preparation of Superconducting Oxide by Sol-Gel Method, S. Sakka, H. Kozuka, T. Umeda, T. Monde and J. Jin, *Powder and Powder Metallurgy*, **35**, 339-343, (1988), in Japanese.

Electrical Conductivity and Chemical Durability in Alkali-Silicate Oxynitride Glasses, H. Unuma, K. Komori and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 913-920, (1987).

Electrical Conductivity in Na-Si-O-N Oxynitride Glasses, H. Unuma and S. Sakka, *J. Mater. Sci. Lett.*, **6**, 996-998, (1987).

Ab Initio Molecular Orbital Study on the Vibrational Spectra of Silicate Glass, M. Murakami and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 225-232, (1987).

Ab Initio Molecular Orbital Calculation of the Interatomic Potential and Force Constants in Silicon Oxynitride Glass, M. Murakami and S. Sakka, *J. Non-Crystal. Solids*, **101**, 271-279, (1988).

The Role of N,N-Dimethylformamide, a DCCA, in the Formation of Silica Gel Monoliths by Sol-Gel Method, T. Adachi and S. Sakka, *J. Non-Crystal. Solids*, **99**, 118–128, (1988).

Sintering of Silica Gel Derived from the Alkoxysilane Solution Containing N,N-Dimethylformamide, T. Adachi and S. Sakka, *J. Non-Crystal. Solids*, **100**, 250–253, (1988).

Preparation of the Silica Gel Monolith by the Sol-Gel Method Using N,N-Dimethylformamide and the Vitrification of the Gel, T. Adachi, S. Sakka and M. Okada, *Yogyo-Kyokai-Shi*, **95**, 970–975, (1987), in Japanese.

Preparation of Monolithic Silica Gel and Glass by the sol-gel Method Using N,N-Dimethylformamide, T. Adachi and S. Sakka, *J. Mater. Sci.*, **22**, 4407–4410, (1987).

Electrical Conductivity of  $ZrF_4$ - $AlF_3$ - $BaF_2$ -Alkali Fluoride Glasses, Xiujian. Zhao and S. Sakka, *J. Non-Crystal. Solids*, **99**, 45–58, (1988).

Properties of Mixed Alkali Fluoride Glasses in the  $ZrF_4$ - $PbF_2$ - $AlF_3$ -RF (R=Li, Na, K) System, Xiujian. Zhao and S. Sakka, *J. Non-Crystal. Solids*, **103**, 93–100, (1988).

Glass Formation and Crystallization in Alkali-Containing Fluoride Glasses, Xiujian. Zhao and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 487–494, (1987).

Mixed Alkali Effect in Elastic Properties of Glasses in the  $ZrF_4$ - $BaF_2$ - $AlF_3$ -RF System (RF=LiF-NaF, NaF-KF), Xiujian. Zhao, H. Kozuka and S. Sakka, *J. Mater. Sci.*, **22**, 4103–4107, (1987).

Properties and Structure of  $Cs_2O$ - $Nb_2O_5$ - $Al_2O_3$  Glasses, K. Fukumi, S. Sakka and T. Kokubo, *J. Non-Crystal. Solids*, **93**, 190–202, (1987).

Raman Spectroscopic Study of the Structural Role of Alkaline Earth Ions in Alkaline Earth Gallate Glasses, K. Fukumi and S. Sakka, *J. Non-Crystal. Solids*, **94**, 251–260, (1987).

Structure of Alkali or Alkaline Earth Metal Gallate Glasses, K. Fukumi and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 193–200, (1987).

Raman Spectra of Binary Alkali and Alkaline Earth Gallate Crystals and Glasses, K. Fukumi and S. Sakka, *Phys. Chem. Glasses*, **29**, 1–8, (1988).

Trimethylsilylation of the Hydrolysed and Polycondensed Productes of Methyltriethoxysilane, I. Hasegawa, S. Sakka, K. Kuroda and C. Kato, *J. Chromatography*, **410**, 137–143, (1987).

The Effect of Sodium Ions on the Distribution of Silicate Anions in Tetramethylammonium Silicate Aqueous Solutions, I. Hasagawa, S. Sakka, K. Kuroda and C.

Kato, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 192–196, (1987).

Treatment of Tetraalkoxysilanes with Amberlyst 15 Cation-Exchange Resin in Presence of Hexamethyldisiloxane, I. Hasegawa and S. Sakka, *Bull. Chem. Soc. Jpn.*, **60**, 4313–4316, (1987).

Treatment of Alkyltriethoxysilanes with Amberlyst 15 Cation-Exchange Resin in the Presence of Hexamethyldisiloxane, I. Hasegawa and S. Sakka, *J. Organometallic Chem.*, **340**, 31–36, (1988).

Influence of the Type of Alkyl Group on Hydrolysis and Polycondensation of Tetraalkoxysilane, I. Hasegawa and S. Sakka, *J. Non-Crystal. Solids*, **100**, 201–205, (1988).

Rapid Solidification of (2-Hydroxyethyl)trimethylammonium Silicate, I. Hasegawa and S. Sakka, *Chem. Lett.*, **1988**, 1319–1322, (1988).

Glass-Forming Region and Structure of Oxyhalide Glasses in the System  $\text{LiCl-Li}_2\text{O-TeO}_2$ , T. Yoko, K. Kamiya, H. Yamada and K. Tanaka, *J. Am. Ceram. Soc.*, **71**, C70–71, (1988).

Study on the Preparation of  $\text{SiO}_2$  Glass Fibers from  $\text{Si}(\text{OC}_2\text{H}_5)_4$ , K. Kamiya, T. Yoko, K. Tanaka, Y. Iwamoto and H. Suzuki, *Rep. Asahi Glass Found. Inf. Technol.*, **50**, 149–159, (1987), in Japanese.

Semiconducting Glass-Ceramics Based on the  $\text{CuAlO}_2\text{-SiO}_2$  System, K. Kamiya, T. Yoko and Y. Miyaji, *Int. J. High Technology Ceramics*, **3**, 297–307, (1987).

Hydrolysis-Condensation Reaction of Tetraethylorthosilicate (TEOS) for Glass Fiber-Drawing, K. Kamiya, T. Yoko and H. Suzuki, *J. Non-Crystal. Solids*, **93**, 407–414, (1987).

Preparation of Fibrous  $\text{ZrO}_2$  and  $\text{CaO-ZrO}_2$  from Zirconium Alkoxide by Sol-Gel Method, K. Kamiya, T. Yoko, K. Tanaka and H. Itoh, *Yogyo-Kyokai-Shi*, **95**, 1157–63, (1987).

ESR Study of a Sol-Gel-Derived Amorphous  $\text{Fe}_2\text{O}_3\text{-SiO}_2$  System, K. Tanaka, K. Kamiya, M. Matsuoka and T. Yoko, *J. Non-Crystal. Solids*, **94**, 365–373, (1987).

Preparation of  $\text{SrTiO}_3$  and  $\text{BaTiO}_3$  Films by the Sol-Gel Method and their Photoelectrochemical Properties, T. Yoko, K. Kamiya and S. Sakka, *Res. Rep. Fac. Eng., Mie Univ.*, **12**, 49–64, (1987).

Photoelectrochemical Properties of the Sol-Gel Derived  $\text{TiO}_2$  Film Electrode—Surface States of the Illuminated  $\text{TiO}_2$  Film Electrode, T. Yoko, A. Yuasa, K. Kamiya, K. Tanaka and S. Sakka, *Res. Rep. Fac. Eng. Mie Univ.*, **12**, 41–48, (1987).

Photoelectrochemical Properties of Sb-Doped  $\text{TiO}_2$  Film Semiconductor Electrode Prepared by the Sol-Gel Method, T. Yoko, A. Yuasa, K. Kamiya, K.

Tanaka and S. Sakka, *J. Chem. Soc. Jpn.*, **11**, 1946–1951, (1987), in Japanese.

Nitridation of  $\text{TiO}_2$  Fibres Prepared by the Sol-Gel Method, K. Kamiya, T. Yoko and M. Bessho, *J. Mater. Sci.*, **22**, 937–941, (1987).

Surface Modification of a  $\text{TiO}_2$  Film Electrode Prepared by the Sol-Gel Method and its Effect on Photoelectrochemical Behavior, T. Yoko, K. Kamiya, A. Yuasa, K. Tanaka and S. Sakka, *J. Non-Crystal. Solids*, **100**, 483–489, (1988).

Structure of  $\text{K}_2\text{O}\cdot 4\text{GeO}_2$  Glass Based on X-Ray Diffraction Analysis, K. Kamiya, T. Yoko, Y. Miki and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 209–216, (1987).

Hydrolysis and Condensation Reactions of  $\text{Si}(\text{OC}_2\text{H}_5)_4$  Related to Silica Fiber Drawing, K. Kamiya, Y. Iwamoto, T. Yoko and S. Sakka, *J. Non-Crystal. Solids*, **100**, 195–200, (1988).

Crystallization Behavior of  $x\text{Na}_2\text{O}\cdot(1-x)\text{GeO}_2$  Glasses and Melts with  $x$  of 0 to 0.30, K. Kamiya, T. Yoko, Y. Hashimoto and S. Sakka, *Mat. Res. Bull.*, **23**, 363–369, (1988).

Low Temperature Formation of Glasses and Ceramics by Sol-Gel Methods, S. Sakka, *International Symposium on Fine Ceramics Arita '87*, 157–168, (1987), in Japanese.

Sol-Gel Preparation and Properties of Fibers and Coating Films, S. Sakka, K. Kamiya and T. Yoko, *ACS Symposium Series*, **360**, 345–353, (1988).

Preparation of Superconducting Films and Fibers by Sol-Gel Method, S. Sakka, *Sankabutsu-Chodendotai-no-Kagaku, Kodan-Sha Saientifikku*, 167–172, (1988), in Japanese.

Rheology of Sols and Fiber Drawing, S. Sakka and H. Kozuka, *J. Non-Crystal. Solids*, **100**, 142–153, (1988).

Chemical Preparation of Glass, S. Sakka, Proc of 1st Int. Conf. of Advances in the Fusion of Glass Alfred University, Alfred, New York, June 14–17, 1988 The Amer. Ceram. Soc., 2.1–2.27, (1988).

$\text{SiO}_2$  Coating Films by Sol-Gel Method, S. Sakka, *Kobunshi*, **37**, 472, (1988), in Japanese.

Bonding between Bioactive Glasses, Glass-Ceramics or Ceramics in a Simulated Body Fluid, T. Kokubo, T. Hayashi, S. Sakka, T. Kitsugi and T. Yamamuro, *Yogyo-Kyokai-Shi*, **95**, 785, (1987).

SEM-EPMA Observation of Three Types of Apatite-Containing Glass-Ceramics Implanted in Bones: The Variance of a Ca-P-rich Layer, T. Kitsugi, T. Nakamura, T. Yamamuro, T. Kokubo, T. Shibuya and M. Katagi, *J. Biomed. Mater. Res.*, **21**, 1255, (1987).

Bonding Behavior between Two Bioactive Ceramics *in vivo*, T. Kitsugi, T.

Yamamuro, T. Nakamura, T. Kokubo, M. Takagi, T. Shibuya, H. Takeuchi and M. Ono, *J. Biomed. Mater. Res.*, **21**, 1109, (1987).

Formation and Optical Properties of  $(R_2O \text{ OR } R'O)\text{-TiO}_2\text{-Ga}_2\text{O}_3$  Glasses, T. Kokubo, Y. Inaka and S. Sakka, *J. Non-Crystal. Solids*, **95 & 96**, 547, (1987).

Fatigue and Life-Time of Bioactive Glass-Cermic A-W Containing Apatite and Wollastonite, T. Kokubo, S. Ito, M. Shigematsu, S. Sakka and T. Yamamuro, *J. Mater. Sci.*, **22**, 4067, (1987).

Strength of Bonding between A-W Glass Ceramic and the Surface of Bone Cortex, S. Yoshii, Y. Kakutani, T. Yamamuro and T. Kokubo, *Biomaterials and Clinical Applications*, 75, (1987).

Unidirectional Solidification of  $\text{Bi}_2\text{O}_3(\text{Nb}_2\text{O}_5)\text{-6Bi}_2\text{O}_3\text{ SiO}_2$  Eutectic by Double Crucible Method, Ho-Kun Kim and T. Kokubo, *Seramikkusu Ronbunshi*, **93**, 323, (1987), in Japanese.

Formation of Zirconia Fibres on Unidirectional Freezing of a Gel, T. Kokubo, Y. Teranishi, T. Maki and S. Sakka, *J. Mater. Sci.*, **23**, 1126, (1987).

Cat's Eye Effect of Directionally Solidified Ingots in the System  $\text{Bi}_2\text{O}_3(\text{Nb}_2\text{O}_5)\text{-6Bi}_2\text{O}_3\text{ SiO}_2$ , Ho-Kun Kim and T. Kokubo, *Seramikkusu Ronbunshi*, **96**, 694, (1988), in Japanese.

Bonding Behavior between Two Bioactive-Ceramics, T. Kitsugi, T. Yamamuro, T. Nakamura, T. Hayashi, T. Kokubo, M. Takagi, T. Shibuya, H. Takeuchi and M. Ono, *Orthopaedic Ceramic Implants*, **5**, 131, (1987), in Japanese.

Apatite Formation on Bioactive Glass and Glass-Ceramics, T. Hayashi, T. Kokubo, S. Sakka, T. Kitsugi and T. Yamamuro, *Orthopaedic Ceramic Implants*, **5**, 125, (1987), in Japanese.

Ceramic Biomaterials, T. Kokubo, *New Glass*, **6**, 21, (1987), in Japanese.

Ceramics for Biomaterials, T. Kokubo, *Kagaku*, **43**, 66, (1988), in Japanese.

Biomedical Applications of Ceramics, T. Kokubo, *New Ceramics*, **1**, 57, (1988), in Japanese.

SEM EPMA Observation between Three Kinds of Glass-Ceramics and Bone, T. Kitsugi, T. Yamamuro, T. Nakamura, T. Kokubo, M. Takagi and T. Shibuya, *Orthopaedic Ceramic Implants*, **5**, 149, (1987), in Japanese.

The Formation of  $\beta\text{-LiFe}_5\text{O}_8$  from Aqueous Suspensions and Its Properties, M. Kiyama, T. Kurata and T. Takada, *Bull. Chem. Soc. Jpn.*, **60**, 3931-3934, (1987).

The Formation and Growth of  $\alpha\text{-Fe}_2\text{O}_3$  Particles by Transformation of  $\gamma\text{-Fe}_2\text{O}_3$  in Alkaline Media, M. Kiyama, F. Kikui and T. Takada, *Bull. Inst. Chem. Res. Kyoto*

*Univ.*, **65**, 187–191, (1987).

Preparation of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  by the Oxalate Coprecipitation Method and Its Power Characterization, Y. Oka, N. Yamamoto, Y. Tomii, H. Kitaguchi, J. Takada, A. Osaka, Y. Miura and M. Kiyama, *Funtai, Funmatuyakin*(*J. Jpn. Soc. Powder, Powder Metallurgy*), **34**, 590–596, (1987), in Japanese.

Decomposition Behavior of High-Tc Superconductor  $\text{YBa}_2\text{Cu}_3\text{O}_x$  in Water, H. Kitaguchi, J. Takada, A. Osaka, Y. Miura, N. Yamamoto, Y. Oka, M. Kiyama, T. Unesaki and Y. Tomii, *Funtai, Funmatuyakin*(*J. Jpn. Soc. Powder, Powder Metallurgy*) **34**, 651–658, (1987) in Japanese.

Superconducting Transition of  $\text{La}_{1.9}\text{Sr}_{0.1}\text{CuO}_{4-\delta}$ , H. Mazaki, M. Takano, Z. Hiroi, Y. Bando, R. Kanno, Y. Takeda and O. Yamamoto, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 147, (1987).

Superconducting Transition of  $\text{RBa}_2\text{Cu}_3\text{O}_{7-x}$  (R:Y, Gd), H. Mazaki, Z. Hiroi, M. Takano, Y. Bando, R. Kanno, Y. Takeda and O. Yamamoto, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 219, (1987).

An Electrochemical Evidence for the Participation of Iron (IV) Porphyrin Species in the C-C Bond Cleavage of 1, 2-Diaryl-1, 2-ethanediol, T. Okamoto, K. Sasaki, M. Takano and S. Oka, *Chem. Lett.*, 415, (1988).

Mössbauer Study of the Trinuclear Clusters in  $[\text{Fe}_3^{3+}\text{Mo}(\text{O}_2\text{CR})_6\text{-L}_3]\text{X}$  ( $\text{M}=\text{Mn}^{2+}$ ,  $\text{Fe}^{3+}$ , and  $\text{Ni}^{2+}$ ), M. Takano, T. Shinjo and A. B. Blake, *Jpn. J. Appl. Phys.*, **26**, 845, (1987).

$\text{Ba}_2\text{YCu}_3\text{O}_x$  Crystal Formed by Peritectic Reaction, J. Takada, H. Kitaguchi, A. Osaka, Y. Miura, K. Takahashi, M. Takano, Y. Ikeda, Y. Bando, N. Yamamoto, Y. Oka and Y. Tomii, *Jpn. J. Appl. Phys.*, **26**, L1707, (1987).

Complex Susceptibility of  $\text{YBa}_2\text{Cu}_3\text{O}_{6.86}$ , H. Mazaki, M. Takano, Y. Ikeda, Y. Bando, R. Kanno, Y. Takeda and O. Yamamoto, *Jpn. J. Appl. Phys.*, **26**, L1749, (1987).

Superconducting Transition of  $\text{GdBa}_2\text{Cu}_3\text{O}_{7-x}$ , H. Mazaki, M. Takano, R. Kanno and Y. Takeda, *Jpn. J. Appl. Phys.*, **26**, L1752, (1987).

Behavior of Fe Impurity in  $\text{YBa}_2\text{Cu}_3\text{O}_y$  Studied by Mössbauer Spectroscopy, M. Takano and Y. Takeda, *Jpn. J. Appl. Phys.*, **26**, L1862, (1987).

Single-Crystal  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Thin Films by Activated Reactive Evaporation, T. Terashima, K. Iijima, K. Yamamoto, Y. Bando and H. Mazaki, *Jpn. J. Appl. Phys.*, **27**, L91, (1988).

Coherent Intergrowth Structure of Tetragonal and Orthorhombic  $\text{Ba}_2\text{YCu}_3\text{O}_{7-x}$  Observed by Transmission Electron Microscopy, Z. Hiroi, M. Takano, Y. Ikeda, Y. Takeda and Y. Bando, *Jpn. J. Appl. Phys.*, **27**, L141, (1988).

Microdomain Structure in  $\text{YBa}_2(\text{Cu}_{1-x}\text{Fe}_x)_3\text{O}_{7-y}$  Observed by Electron Microscopy, Z. Hiroi, M. Takano, Y. Takeda, R. Kanno and Y. Bando, *Jpn. J. Appl. Phys.*, **27**, L580, (1988).

High- $T_c$  Phase Promoted and Stabilized in the Bi, Pb-Sr-Ca-Cu-O System, M. Takano, J. Takada, K. Oda, H. Kitaguchi, Y. Miura, Y. Ikeda, Y. Tomii and H. Mazaki, *Jpn. J. Appl. Phys.*, **27**, L1041, (1988).

The Effect of Annealing in High-Pressure Oxygen on  $\text{YBa}_2(\text{Cu}_{1-x}\text{M}_x)_3\text{O}_y$  ( $\text{M}=\text{Co}, \text{Ni}, \text{Zn}$ ), Y. Shimakawa, Y. Kubo, K. Utsumi, Y. Takeda and M. Takano, *Jpn. J. Appl. Phys.*, **27**, L1071, (1988).

Equilibrium Phase Diagram for the  $\text{La}_2\text{O}_3\text{-SrO-CuO}$  System at 1173K in Air, H. Kitaguchi, M. Ohono, M. Kaichi, J. Takada, A. Osaka, Y. Miura, Y. Ikeda, M. Takano, Y. Bando, Y. Takeda, R. Kanno and O. Yamamoto, *J. Ceram. Soc. Jpn. Inter. Ed.*, **96**, 388, (1988).

Superconducting Properties of  $\text{GdBa}_2(\text{Cu}_{1-x}\text{Fe}_x)_3\text{O}_y$  ( $x \leq 0.04$ ), M. Takano, H. Mazaki, Z. Hiroi, Y. Bando, Y. Takeda and O. Yamamoto, *J. Ceram. Soc. Jpn. Inter. Ed.*, **96**, 328, (1988).

$\text{Gd}^{3+}$  EPR of High Temperature Superconductor  $\text{GdBa}_2\text{Cu}_3\text{O}_x$ , H. Kikuchi, Y. Ajiro, Y. Ueda, K. Kosuge, M. Takano, Y. Takeda and M. Sato, *J. Phys. Soc. Jpn.*, **57**, 1887, (1988).

Dependence of the Structure and Electronic State of  $\text{SrFeO}_x$  ( $2.5 \leq x \leq 3$ ) on Composition and Temperature, M. Takano, T. Okita, N. Nakayama, Y. Bando, Y. Takeda, O. Yamamoto and J. B. Goodenough, *J. Solid State Chem.*, **73**, 140, (1988).

Phase Relation and Superconductivity in the Oxygen Nonstoichiometric System,  $\text{Ba}_2\text{YCu}_3\text{O}_x$ , R. Kanno, Y. Takeda, M. Hasegawa, O. Yamamoto, M. Takano, Y. Ikeda and Y. Bando, *Mat. Res. Bull.*, **22**, 1525, (1987).

Superconducting Properties of  $\text{GdBa}_2(\text{Cu}_{1-x}\text{Fe}_x)_3\text{O}_y$  ( $x \leq 0.04$ ), M. Takano, H. Mazaki, Z. Hiroi, Y. Bando, Y. Takeda and O. Yamamoto, *Nippon-Seramikkusu-Kyokai-Gakujutsu-Ronbunshi*, **96**, 407, (1988).

Single Crystal  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Thin Films by Activated Reactive Evaporation, Y. Bando, T. Terashima, K. Iijima, K. Yamamoto and H. Mazaki, *Physica C*, **153-155**, 810, (1988).

$\text{RBa}_2\text{Cu}_3(1-x)\text{Fe}_x\text{O}_y$ : Microstructure and Superconductivity, M. Takano, Z. Hiroi, H. Mazaki, Y. Bando, Y. Takeda and R. Kanno, *Physica C*, **153-155**, 860, (1988).

Observation of Gap Anisotropy in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  by Tunneling, J. S. Tsai, I. Takeuchi, J. Fujita, T. Yoshitake, S. Miura, S. Tanaka, T. Terashima, Y. Bando, K. Iijima and K. Yamamoto, *Physica C*, **153-155**, 1385, (1988).



Microstructure and Superconducting Properties of Sintered Materials and Single Crystal Films of YBCO, Y. Bando, *Proc. Special Symp. Advanced Mat. (Tokyo)*, 107, (1988).

Magnetic Ordering of Triangular-Cluster Spins in  $[\text{Fe}_3\text{O}(\text{O}_2\text{CCH}_3)_6(\text{H}_2\text{O})_3]\text{Cl}\cdot 6\text{H}_2\text{O}$ , M. Takano and T. Shinjo, *Solid State Commun.*, **63**, 945, (1987).

Short Chain Ordering Model in  $\text{Ba}_2\text{YCu}_3\text{O}_{6+c}$ , Z. Hiroi and T. Takano, *Solid State Commun.*, **65**, 1549, (1988).

Influence of Substrate Temperature and Film Thickness on the Structure of Reactive Evaporated  $\text{In}_2\text{O}_3$  Films, S. Muranaka, Y. Bando and T. Takada, *Thin Solid Films*, **151**, 355, (1987).

Formation and Magnetic Properties of Artificial Superlattice of  $\text{CoO-Fe}_3\text{O}_4$ , T. Terashima and Y. Bando, *Thin Solid Films*, **152**, 455, (1987).

Single-Crystal  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Thin Film by Activated Reactive Evaporation, Y. Bando, T. Terashima, K. Iijima, K. Yamamoto, K. Hirata and H. Mazaki, *Extend. Abstracts of 5th International Workshop on Future Devices*, 11, (1988).

Energy of Gap Anisotropy in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ , J. S. Tsai, I. Takeuchi, J. Fujita, T. Yoshitake, S. Miura, S. Tanaka, T. Terashima, Y. Bando, K. Iijima and K. Yamamoto, *Extend. Abstracts of 5th International Workshop on Future Devices*, 219, (1988).

Preparation and Structure of Artificial Superlattices of Oxides and Selenides, Y. Bando, *Bull. Jpn. Inst. Metals*, **26**, 783, (1987), in Japanese.

Formation and Structure of Iron-Iron Oxide Multilayered Films, T. Terashima and Y. Bando, *Chem. Soc. Jpn.*, No. 11, 1891, (1987) in Japanese.

Composition of Amorphous Tin Oxide Films and Their Thermal Behavior, S. Muranaka, Y. Bando and T. Takada, *Chem. Soc. Jpn.*, No. 11, 1886, (1987), in Japanese.

Preparation of Co Ultrafine Particles by Reduction of Multilayered  $\text{CoO/SiO}_x$  Films, Y. Bando and T. Terashima, *J. Cryst. Soc. Jpn.*, **30**, 37, (1988), in Japanese.

High  $T_c$  Superconductor, Y. Bando, *Kagaku to Kyoiku*, **36**, 154, (1988), in Japanese.

Equilibrium Phase Diagram for the  $\text{La}_2\text{O}_3\text{-SrO-CuO}$  System at 1173K in Air, H. Kitaguchi, M. Ohno, M. Kaichi, J. Takada, A. Osaka, Y. Miura, Y. Ikeda, M. Takano, Y. Bando, Y. Takeda, R. Kanno and O. Yamamoto, *Nippon-Seramikkusu-Kyokai-Gakujutsu-Ronbunshi*, **96**, 397, (1988), in Japanese.

Structure and Magnetism of Artificial Superlattice Films of Oxides, Y. Bando, M. Takano and T. Terashima, *Oyo Butsuri*, **56**, 1337, (1987), in Japanese.

Subsolidus Phase Equilibrium in the System  $Y_2O_3$ -BaO-CuO at 900°C in Air, Y. Ikeda, M. Takano, Y. Bando, H. Kitaguchi, J. Takada, Y. Miura, A. Osaka and K. Takahashi, *Powd. and Powd. Metal.* **34**, 580, (1987), in Japanese.

Formation of  $YBa_2Cu_3O_x$  by Peritectic Reaction, J. Takada, H. Kitaguchi, A. Osaka, Y. Miura, K. Takahashi, Y. Ikeda, M. Takano, Y. Bando, Y. Tomii, N. Yamamoto and Y. Oka, *Powd. and Powd. Metal.*, **34**, 583, (1987), in Japanese.

Transmission Electron Microscopic Study of  $Ba_2YCu_3O_{7-x}$ , Z. Hiroi, Y. Ikeda, M. Takano, Y. Bando and Y. Takeda, *Powd. and Powd. Metal.*, **34**, 597, (1987), in Japanese.

Synthesis of  $YBa_2Cu_3O_y$  under High Oxygen Pressure, Y. Takeda, R. Kanno, O. Yamamoto, M. Takano, Y. Ikeda and Y. Bando, *Powd. and Powd. Metal.*, **34**, 601, (1987), in Japanese.

Properties of Grain Boundary of Sintered  $YBa_2Y_1Cu_3O_x$  in Terms of Complex Susceptibility, H. Mazaki, M. Takano, Y. Ikeda, Y. Bando, Y. Takeda and R. Kanno, *Powd. and Powd. Metal.*, **34**, 620, (1987), in Japanese.

Decomposition Behavior of High- $T_c$  Superconductor  $YBa_2Cu_3O_x$  in Water, H. Kitaguchi, J. Takada, A. Osaka, Y. Miura, N. Yamamoto, Y. Oka, M. Kiyama, T. Unesaki and Y. Tomii, *Powd. and Powd. Metal.*, **34**, 651, (1987), in Japanese.

Growth and Structure of Artificial Superlattice Single Crystal Films of Selenides and Oxides, Y. Bando, *Powd. and Powd. Metal.*, **35**, 189, (1988), in Japanese.

Synthesis of  $YBaSrCu_3O_y$  under High Oxygen Pressure, Y. Takeda, R. Kanno, K. Ina, O. Yamamoto, M. Takano, Z. Hiroi and Y. Bando, *Powd. and Powd. Metal.*, **35**, 349, (1988), in Japanese.

Subsolidus Phase Relation in the  $Bi_{0.5}$ -SrO-CaO-CuO System in Air, Y. Ikeda, Y. Oue, K. Inaba, Y. Bando and M. Takano, *Powd. and Powd. Metal.*, **35**, 405, (1988), in Japanese.

Complex Susceptibility of Bi-System Superconductors, H. Mazaki, Y. Ikeda, M. Takano, Y. Bando, K. Oda, H. Kitaguchi, J. Takada and Y. Miura, *Powd. and Powd. Metal.*, **35**, 413, (1988), in Japanese.

Behavior of Fe Impurity, M. Takano, eds. Kazuo Fueki and Koichi Kitazawa, Kodansha, 1988 Sankabutsu Chodendotai no Kagaku, 239, (1988), in Japanese.

NMR Study of V/Ag Multilayered Superconductors, T. Imai, M. Takigawa, H. Yasuoka, T. Mizutani, N. Hosoi and T. Shinjo, *Japanese Journal of Applied Physics*, **26**, 1457, (1987).

Superconducting Fluctuations and Transition Temperatures of Ultrathin V Films and V-Si Multilayered Systems, K. Kanoda, H. Mazaki, T. Mizutani, N. Hosoi and

T. Shinjo, *Japanese Journal of Applied Physics*, **26**, 1433, (1987).

Superconductivity in V/Si Multilayered Films, N. Hosoito, T. Mizutani, K. Ohhashi, K. Kanoda, H. Mazaki and T. Shinjo, *Japanese Journal of Applied Physics*, **26**, 1435, (1987).

Local Magnetic Moment in Al-Mn Based Quasicrystals, K. Edagawa, H. Ino, S. Nasu, K. Kimura, S. Takeuchi, T. Shinjo, K. Koga, T. Shimizu and H. Yasuoka, *Journal of the Physical Society of Japan*, **56**, 2629, (1987).

A Low-Temperature<sup>119</sup> Sn Mössbauer Study of ErPd<sub>2</sub>Sn, T. Shinjo, J. Sakurai, K. Mibu and T. Kusuda, *Journal of the Physical Society of Japan*, **56**, 3035, (1987).

<sup>57</sup>Fe Mössbauer Effects in High-T<sub>c</sub> Superconductor: Y-Ba-Cu Oxides, S. Nasu, H. Kitagawa, Y. Oda, T. Kohara, T. Shinjo, K. Asayama and F. E. Fujita, *Physica*, **148B**, 484, (1987).

Artificially Structured Metallic Multilayers, T. Shinjo, *Tetsu to Hagane* **11**, 1479, (1987), in Japanese.

Artificial Metallic Multilayers; Structures and Magnetism, T. Shinjo, *Oyo Buturi*, **56**, 1331, (1987), in Japanese.

Epitaxial Growth of Mn-Sb Multilayered Films, N. Nakayama, I. Molitani and T. Shinjo, *Journal of the Chemical Society of Japan, Chemistry and Industrial Chemistry*, **11**, 1880, (1987), in Japanese.

Magnetic Properties of Multilayered Films and Superlattices, T. Shinjo, *Kotai buturi (Solid state Physics)*, **22**, 69, (1987), in Japanese.

Magnetic Ordering of Triangular-Cluster Spins in [Fe<sub>3</sub>O(O<sub>2</sub>CCH<sub>3</sub>)<sub>6</sub>(H<sub>2</sub>O)<sub>3</sub>CL-6H<sub>2</sub>O], M. Takano and T. Shinjo, *Solid State Communications* **63**, 945, (1987).

Mössbauer Effect of <sup>57</sup>Fe in Spin Frustration System, CsCoCi<sub>3</sub>, M. Mekata, T. Yamana, S. Okamota, K. Yoshimura, N. Hosoito and T. Shinjo, *Hyperfine Interactions*, **41**, 495, (1988).

Fe/Dy Artificial Multilayered Films Studied by <sup>57</sup>Fe Mössbauer Spectroscopy, N. Hosoito, K. Yoden and T. Shinjo, *Hyperfine Interactions*, **41**, 583, (1988).

Mössbauer Studies at Milli-Kelvin Temperature Region, T. Shinjo, *Hyperfine Interactions* **42**, 1173, (1988).

Anomalous X-Ray Scattering Study of Composition Profile in Fe/Mn Superlattice Films, N. Nakayama, I. Moritani, T. Shinjo, Y. Fujii and S. Sasaki, *J. Phys. F: Met. Phys.*, **18**, 429, (1988).

Mössbauer Study of Fe/C Multilayered Films, N. Nakayama, T. Katamoto, T. Shinjo and T. Takada, *J. Phys. F: Met Phys.*, **18**, 443, (1988).

Structural and Magnetic Properties of Fe/Mn Superlattice Films and Their Interfaces, N. Nakayama, T. Katamoto and T. Shinjo, *J. Phys. F: Met. Phys.*, **18**, 935, (1988).

Cr/Sb Artificial Superlattice Films; Preparation and Magnetic Properties, H. Dounomae, I. Moritani, N. Nakayama and T. Shinjo, *Journal of the Japan Society of Powder and Powder Metallurgy*, **35**, 194, (1988), in Japanese.

### Organic Chemistry

NAD(P)<sup>+</sup>-NAD(P)H Models. 63. Regioselective Reduction of Dienoic Ketones and Aldehydes with an NAD(P)H Model on Silica Gel, M. Fujii, K. Nakamura, S. Yasui, S. Oka and A. Ohno, *Bull. Chem. Soc. Jpn.*, **60**, 2423, (1987).

NAD(P)<sup>+</sup>-NAD(P)H Models. 64. The Quantitative Elucidation of the Mechanistic Aspects in the Silica Gel-Catalyzed Reduction of  $\alpha$ ,  $\beta$ -Unsaturated Carbonyl Compounds by a Model of NAD(P)H, S. Yasui, M. Fujii, and A. Ohno, *Bull. Chem. Cos. Jpn.*, **60**, 4019, (1987).

NAD(P)H<sup>+</sup>-NAD(P)H Models. 60. Induction of Double Asymmetry in the Reduction of  $\alpha$ -Keto Esters, A. Ohno, T. Yasuma, K. Nakamura, and S. Oka, *Israel Journal of Chemistry*, **28**, 51, (1987/88).

NAD(P)<sup>+</sup>-NAD(P)H Models. 65. Photochemical Reductive Desulfonylation of  $\beta$ -Keto Sulfones with Hantzsch Ester, M. Fujii, K. Nakamura, H. Mekata, S. Oka and A. Ohno, *Bull. Chem. Soc. Jpn.*, **61**, 495, (1988).

*t*-Butylsulfinyl Phenylmethyl Carbanion. Conformation in Nonpolar Solvent, A. Ohno, M. Higaki, and S. Oka, *Bull. Chem. Soc. Jpn.*, **61**, 1721, (1988).

NAD(P)<sup>+</sup>-NAD(P)H Models. 66. Stereospecific Interconversion between Different Chiralities in the Reduction of a Quinolinium Salt, A. Ohno, M. Ogawa, and S. Oka, *Tetrahedron Lett.*, **29**, 1951, (1988).

Stereochemical Control on Yeast Reduction of  $\alpha$ -Keto Esters. Reduction by Immobilized Bakers' Yeast in Hexane, K. Nakamura, K. Inoue, K. Ushio, S. Oka and A. Ohno, *J. Org. Chem.*, **53**, 2589, (1988).

NAD(P)<sup>+</sup>-NAD(P)H Models. 67. Stereospecific Conversion of Central Chirality into Axial Chirality as a Model for Chemical Evolution of a Dehydrogenase, A. Ohno, M. Ogawa, and S. Oka, *Tetrahedron Lett.*, **29**, 3079, (1988).

Enantioselective Reduction of 2-Methyl-3-oxopropionate by Bakers' Yeast, K. Nakamura, T. Miyai, K. Ushio, S. Oka and A. Ohno, *Bull. Chem. Soc. Jpn.*, **61**, 2089, (1988).

Asymmetric Reduction of Ketones by Glycerol Dehydrogenase from *Geotricum*, K. Nakamura, T. Yoneda, T. Miyai, K. Ushio, S. Oka and A. Ohno, *Tetrahedron Lett.*,

29, 2453, (1988).

Asymmetric Reduction of  $\beta$ - and  $\gamma$ -Nitro Ketones by Bakers' Yeast, K. Nakamura, Y. Inoue, J. Shibahara, S. Oka and A. Ohno, *Tetrahedron Lett.*, **29**, 4769, (1988).

Selective Partial Hydrogenation of N-Substituted-3-carbamoyl-pyridinium Salts to Corresponding Dihydropyridines Catalyzed by Bis(dimethylglyoximate)chloro(pyridine)cobalt, T. Okamoto, S. Yamamoto and S. Oka, *J. Mol. Catalysis*, **39**, 219, (1987).

A High-Yield Regiospecific Synthesis of Keto Oximes from Aryl-Conjugated Ethylenes and Ethyl Nitrite in the Presence of Cobalt Complex and  $\text{BH}_4^-$ , T. Okamoto, K. Kobayashi, S. Oka and S. Tanimoto, *J. Org. Chem.*, **53**, 4897, (1988).

A Novel Approach to the Synthesis of Two Versatile Synthetic Intermediates, 2, 3-Bis(bromomethyl)-1, 3-butadiene and Tetrakis-(bromomethyl)ethylene, S. M. Ali, S. Tanimoto and T. Okamoto, *J. Org. Chem.*, **53**, 3639, (1988).

An Electrochemical Evidence for the Participation of Iron(IV) Porphyrin Species in the C-C Bond Cleavage of 1, 2-Diaryl-1, 2-ethanediol, T. Okamoto, K. Sasaki, M. Takano and S. Oka, *Chem. Lett.*, 415, (1988).

Aminolysis of Halogenopyridines at High Pressures, S. Hashimoto, S. Otani, T. Okamoto, and K. Matsumoto, *Heterocycles*, **27**, 319, (1988).

Aminolysis of Halo(trifluoromethyl)benzenes at High Pressures, K. Matsumoto, T. Uchida, T. Okamoto and S. Hashimoto, *Chemistry Express*, **2**, 551, (1987).

Effect of Catalyst on the Oxygenation of Styrene with  $\text{BH}_4^-$  and Molecular Oxygen, T. Okamoto, Y. Sasaki, K. Sasaki and S. Oka, *Bull. Chem. Soc. Jpn.*, **60**, 4449, (1987).

Biomimetic Oxidation with Molecular Oxygen. Selective Carbon-Carbon Bond Cleavage of 1, 2-Diols by Molecular Oxygen and Dihydropyridine in the Presence of Iron-Porphyrin, T. Okamoto, K. Sasaki and S. Oka, *J. Am. Chem. Soc.*, **110**, 1187, (1988).

Biomimetic Approach to Lignin Degradation. II. The Mechanism of Oxidative C-C Bond Cleavage Reactions of Lignin Model Compounds with Natural Iron(III) Porphyrin Chloride as a Heme-Enzyme Model System, M. Shimada, T. Habe, T. Higuchi, T. Okamoto and B. Panijpan, *Holzforschung*, **41**, 277, (1987).

Palladium(II) Chloride Catalyzed Carbonylation of Organic Tellurides with Carbon Monoxide, K. Ohe, H. Takahashi, S. Uemura and N. Sugita, *J. Org. Chem.*, **52**, 4859, (1987).

$\text{Co}_2(\text{CO})_8$ -Mediated and -catalyzed Carbonylation of Diaryl Diselenides and Ditellurides to Seleno and Telluro Esters, H. Takahashi, K. Ohe, S. Uemura and N.

Sugita, *J. Organometal. Chem.*, **334**, C43, (1987).

Palladium(0)-catalyzed Carbonylation of Alkenyl- and Aryl-Borates and Boronic Acids with Carbon Monoxide, T. Ohe, K. Ohe, S. Uemura and N. Sugita, *J. Organometal. Chem.*, **344**, C5, (1988).

The Palladium(II)/Carbon Monoxide-mediated Biaryl Formation from Aryltellurium Trihalides, H. Takahashi, K. Ohe, S. Uemura and N. Sugita, *J. Organometal. Chem.*, **350**, 227, (1988).

Oxidative Conversion of  $\beta$ -Hydroxyselenides to Epoxides and Ketones with meta-Chloroperbenzoic Acid, S. Uemura, K. Ohe and N. Sugita, *J. Chem. Soc., Chem. Commun.*, 111, (1988).

Sodium Benzenetellurolate-catalysed Selective Reduction of Aromatic Nitro Compounds to Azoxy Compounds, K. Ohe, H. Takahashi, S. Uemura and N. Sugita, *J. Chem. Soc., Chem. Commun.*, 591, (1988).

Preparation of Alkyl Tellurides and Their Reactions with Carbon Monoxide, K. Ohe, H. Takahashi, S. Uemura and N. Sugita, *Nippon Kagaku Kaishi (Journal of the Chemical Society of Japan, Chemistry and Industrial Chemistry)*, 1469, (1987), in Japanese.

Stereo- and Regioselectivity in the Addition of Benzenetellurolate Ion to Triple Bond, H. Takahashi, K. Ohe, S. Uemura and N. Sugita, *Nippon Kagaku Kaishi (Journal of the Chemical Society of Japan, Chemistry and Industrial Chemistry)*, 1511, (1987), in Japanese.

The Ritter Reaction of  $\alpha$ -Oxo-benzeneacetonitrile with Several Compounds Capable of Forming a Carbonium Ion, C. P. Reddy and S. Tanimoto, *Bull. Inst. Chem. Res., Kyoto University*, **65**, 125, (1987).

A Wittig Type Rearrangement of 2-Methoxycarbonyl-2-phenyl-1, 3-dithiane and 2, 2-Diphenyl-1, 3-dithiepane, Y. Inoue and S. Tanimoto, *Bull. Inst. Chem. Res., Kyoto University*, **65**, 121, (1987).

A Novel Approach to the Synthesis of Two Versatile Synthetic Intermediates, 2, 3-Bis(bromomethyl)-1, 3-butadiene and Tetrakis (bromomethyl) ethylene, S. M. Ali, S. Tanimoto and T. Okamoto, *J. Org. Chem.*, **53**, 3639, (1988).

Cobalt-Catalyzed Reaction of Nitric Oxide with Aryl-Substituted Olefins in the Presence of Tetrahydroborate Ion, T. Okamoto, K. Kobayashi, S. Oka and S. Tanimoto, *J. Org. Chem.*, **52**, 5089, (1987).

Reactions of Trimethylsilyl Ketene Acetals with Benzoyl Cyanide and with  $\alpha$ -Keto Esters, C. P. Reddy and S. Tanimoto, *J. Chem. Soc., Perkin Trans. I*, 411, (1988).

Organic Selenocyanates and Tellurocyanates and Related Compounds, A. Toshimitsu and S. Uemura, *The Chemistry of Organic Selenium and Tellurium*

Compounds. Ed. by S. Patai, John Wiley & Sons, 1987. **2**, 541–590, (1987).

Novel Asymmetric Synthesis of Optically Active  $\delta$ - and  $\gamma$ - Lactones Using a C<sub>2</sub>-chiral Auxiliary, A. Sakamoto, Y. Yamamoto and J. Oda, *J. Am. Chem. Soc.*, **109**, 7188–7189, (1987).

Weitz-Scheffer Type Asymmetric Epoxidation by Utilization of Molecular Oxygen Under Phase Transfer Condition, N. Baba, S. Kawahara, M. Hamada and J. Oda, *Bull. Inst. Chem. Res. Kyoto University.*, **65**, 144–146, (1987).

Enantiotopic-Group Differentiation. Asymmetric Mono-esterification of Malonic Acids Using Cinchona Alkaloid Derivations, J. Hiratake, K. Shibata, N. Baba, J. Oda, *Synthesis*, 278–280, (1988).

Asymmetric Ring Opening of Cyclic Acid Anhydrides with Lipase in Organic Solvents, K. Yamamoto, T. Nishioka, J. Oda and Y. Yamamoto, *Tetrahedron Lett.*, **29**, 1717–1720, (1988).

Molecular Biological Analysis of Sequence-Specific DNA Recognition and Cleavage by Metallobleomycins, J. Kuwahara and Y. Sugiura, *Nucleic Acids Res. (Symp. Ser.)*, **19**, 131–134, (1988).

Sequence-specific Recognition and Cleavage of DNA by Metallobleomycin: Minor Groove Binding and Possible Interaction Mode, J. Kuwahara and Y. Sugiura, *Proc. Natl. Acad. Sci. USA*, **85**, 2459–2463, (1988).

Effect of Oridonin, a Rhabdosia Diterpenoid, on Radiosensitization with Misonidazole, C. Murayama, Y. Nagao, S. Sano, M. Ochiai, K. Fuji and T. Mori, *Experientia*, **46**, 1221, (1987).

A New Finding in the Dieckmann Type Annulation of a Chiral Half-Thiol Diester Having Latent  $\sigma$ -Symmetry, Y. Nagao, T. Nakamura, M. Ochiai, K. Fuji and E. Fujita, *Chemistry Lett.*, 1861, (1987).

sp-Carbon-Iodine Bond Cleavage of Alkynyl(phenyl)iodonium Salts, Novel Synthesis of (Alkylethynyl)triphenylphosphonium Salts, M. Ochiai, M. Kunishima, Y. Nagao, K. Fuji and E. Fujita, *J. Chem. Soc., Chem. Commun.*, 1708, (1987).

Iodosylbenzene-Trimethylsilyl Azide-Boron Trifluoride Etherate: A Highly Efficient System for Direct Synthesis of Allyl Azides from Allylsilanes, M. Arimoto, H. Yamaguchi, E. Fujita, M. Ochiai and Y. Nagao, *Tetrahedron Lett.*, **28**, 6289, (1987).

Extremely Short Chiral Synthesis of Bicyclic Alkaloids Having a Nitrogen Atom Ring Junction, Y. Nagao, W.-M. Dai, M. Ochiai, S. Tsukagoshi and E. Fujita, *J. Am. Chem. Soc.*, **110**, 289, (1988).

Simplified Chiral Aminolysis of Prochiral  $\sigma$ -Symmetric Dicarboxylic Anhydrides with Sodium Salt of 4(*S*)-IPTT, Y. Nagao, Y. Hagiwara, Y. Hasegawa, M. Ochiai, T.

Inoue, M. Shiro and E. Fujita, *Chemistry Lett.*, 381, (1988).

Development of New Synthetic Reactions Utilizing Organosilicon and Tin Compounds, M. Ochiai, *J. Pharm. Soc. Japan*, **108**, 271, (1988), in Japanese.

Organotin Compounds in Organic Synthesis, M. Ochiai, *Petrotech*, **11**, 19, (1988), in Japanese.

Syntheses of (*rac*)3-Substituted 4-Methoxycarbonyl-1, 3-thiazolidine-2-thiones via Rearrangement of a Substituted Group from *exo*-S to N in (*rac*)2-Substituted Thio-4-methoxycarbonyl- $\Delta^2$ -1, 3-thiazolines, Y. Nagao, K. Inoue, M. Yamaki, S. Takagi and E. Fujita, *Chem. Pharm. Bull.*, **36**, 495, (1988).

Substituent Effect of the Benzene Ring on Thermal Rearrangement of the Substituted Benzyl Group from *exo*-S to N(3) in (*rac*)2-Substituted Benzylthio-4-methoxycarbonyl- $\Delta^2$ -1, 3-thiazolines, Y. Nagao, K. Inoue, M. Yamaki, S. Takagi and E. Fujita, *Chem. Pharm. Bull.*, **36**, 509, (1988).

Intramolecular Hypervalent Sn-O Interaction. The Origin for Fixation of Six-Membered Carbocycles to the 1, 3-Diaxial Conformer and for Stereoselective Osmylations, M. Ochiai, S. Iwaki, T. Ukita, Y. Matsuura, M. Shiro and Y. Nagao, *J. Am. Chem. Soc.*, **110**, 4606, (1988).

Reactions of Vinylsilanes with Lewis Acid-Activated Iodosylbenzene: Stereospecific Syntheses of Vinyliodonium Tetrafluoroborates and Their Reactions as Highly Activated Vinyl Halides, M. Ochiai, K. Sumi, Y. Takaoka, M. Kunishima, Y. Nagao, M. Shiro and E. Fujita, *Tetrahedron*, **44**, 4095, (1988).

Synthesis and Structure Analysis of a Vinyliodonium Salt with an  $\alpha$ -Silyl Substituent and Generation of an Iodonium Ylide from it, M. Ochiai, M. Kunishima, K. Fuji, M. Shiro and Y. Nagao, *J. Chem. Soc., Chem. Commun.*, 1076, (1988).

Stereoselective Nitroolefination of Active Methine of Various Carbonyl Compounds with  $\beta$ -Nitroenamines, M. Node, H. Nagasawa, Y. Naniwa and K. Fuji, *Synthesis*, 729, (1987).

Regioselective Hydroxylation in the C-ring of *ent*-Kaurens; Synthesis of *ent*-11 $\alpha$ -Hydroxykaurene and *ent*-11 $\alpha$ -Hydroxykauren-15-one, M. Node, T. Kajimoto, E. Fujita and K. Fuji, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 129, (1987).

Expeditious Enantioselective Syntheses of Indole Alkaloids of *Aspidosperma*- and *Hunteria*-Type, M. Node, H. Nagasawa and K. Fuji, *J. Am. Chem. Soc.*, **109**, 7901, (1987).

New Chiral Shift Reagents, Optically Active 2, 2'-Dihydroxy-1, 1'-binaphthyl and 1, 6-Di(o-chlorophenyl)-1, 6-diphenylhexa-2, 4-diyne-1, 6-diol, F. Toda, K. Mori, J. Okada, M. Node, A. Itoh, K. Oomine and K. Fuji, *Chem. Lett.*, 131, (1988).



## Polymer Chemistry

Nonlinear Viscoelastic Behavior of Aqueous Detergent Solution, E. Takatori and K. Osaki, *Journal of Non-Newtonian Fluid Mechanics*, **28**, 171–182, (1988).

Stress Relaxation of Semidilute Polystyrene Solutions. A New Observation with -Solvent and with Blends Containing Very Short Chains, K. Osaki, E. Takatori, S. Shibasaki and M. Kurata, *Polymer Journal*, **20**, 511–513, (1988).

Rheology of Ploymeric Liquids, K. Osaki, *Hyomen*, **25**, 648–657, (1987), in Japanese.

Nonlinear Viscoelasticity of Semidilute Polystyrene Solutions. Effect of Molecular Weight Distribution, K. Osaki, E. Takatori and M. Kurata, *Macromolecules*, **20**, 1681–1687, (1987).

Flow Birefringence of a Triblock Copolymer in Steady Shear Flow, K. Osaki and E. Takatori, *Nihon Reoroji Gakkaishi*, **16**, 81–85, (1988), in Japanese.

Nonlinear Viscoelasticity and Polymer Chain Entanglement, K. Osaki, *Molecular Conformation and Dynamics of Macromolecules in Condensed Systems*, **2**, 185–201, (1988).

Hydrodynamic and Topological Interactions in Sedimentation of Poly(methyl methacrylate) in Semidilute Solutions of Polystyrene in Thiophenol, N. Nemoto, S. Okada, T. Inoue and M. Kurata, *Macromolecules*, **21**, 1502–1508, (1988).

Comparison of the Sedimentation Data with the Hess Theory and with Self-Diffusion Coefficient Data of Polystyrene in the Semidilute Regime and in Melts, N. Nemoto, S. Okada, T. Inoue, and M. Kurata, *Macromolecules*, **21**, 1509–1513, (1988).

Measurements of Self Diffusion Coefficient with Fluorescence Recovery after Pattern Photo-Bleaching and Forced Rayleigh Scattering Methods, T. Inoue, N. Nemoto, T. Kojima, Y. Tunashima and M. Kurata, *Nihon Reoroji Gakkaishi*, **16**, 72–80, (1988), in Japanese.

Micellar Structure of Poly(N-Ethyl-2-Vinylpyridinium Hydroxide)-Block-Polystyrene in Aqueous Solutions, M. Hirata, N. Nemoto, Y. Tsunashima and M. Kurata, *Ordering and Organisation in Ionic Solutions*, 111–120, (1987).

Phase Diagram of Polyelectrolyte Solutions, K. Kaji, H. Urakawa, T. Kanaya and R. Kitamaru, *J. Phys. (France)*, **49**, 993, (1988).

Structure of Ployelectrolyte Solutions, K. Kaji, The 1st KEK Symposium on Ultra Cold Neutrons (UCN), 36, (1988).

Textural Structure of Crystalline Polymers and High Strength Materials, K. Kaji, Surveyor's Reports on High Stregth Polymer Materials, 89, (1988).

Dynamic Light Scatterig Studies of Polymer Solutions. 6. Polyisoprenes in a

**θ**-Solvents, 1, 4-Dioxane, Y. Tsunashima, M. Hirata, N. Nemoto and M. Kurata, *Macromolecules*, **20**, 2862, (1987).

Dilute Solution Properties of *cis*-Polyisoprene in Cyclohexane and 1, 4-Dioxane, Y. Tsunashima, M. Hirata, N. Nemoto and M. Kurata, *Macromolecules*, **21**, 1107, (1988).

Effect of Short-Range Correlation between Chain Elements on the Hydrodynamic Radius and the First Cumulant in Dilute Polymer Solutions, Y. Tsunashima, *Macromolecules*, **21**, 2575, (1988).

Permselective Membranes of Silicone-Containing Polymers. Permeation of Gases and Gases and Gas Mixtures through Poly[1-(trimethylsilyl)-1-propyne] Membrane, H. Odani, *Kobunshi*, **37**, 452, (1988).

CP/MAS  $^{13}\text{C}$  NMR Spectra of the Crystalline Components of Native Celluloses, F. Horii, A. Hirai and R. Kitamaru, *Macromolecules*, **20**, 2117, (1987).

Transformation of Native Cellulose Crystals Induced by Saturated Steam at High Temperatures, F. Horii, H. Yamamoto, R. Kitamaru, M. Tanahashi and T. Higuchi, *Macromolecules*, **20**, 2946, (1988).

CP/MAS  $^{13}\text{C}$  NMR Study for the Characterization of Water Sorbed in Poly(p-phenylene terephthalamide) Fiber (Kevlar 49), M. Fukuda, H. Kawai, F. Horii and R. Kitamaru, *Polym. Commun.*, **29**, 97, (1988).

Progress in High-Resolution Solid-State NMR, F. Horii, *Kagaku Kogyo*, **39**, 44, (1988), in Japanese.

Developments in Studies of Molecular Motions in Polymer Solids by NMR, F. Horii, *Kagai Kobunshi Kenkyu*, **33**, 262, (1987), in Japanese.

Crystal Polymorphs of Amylose as Revealed by CP/MAS  $^{13}\text{C}$  NMR, H. Yamamoto, F. Horii, A. Hirai, R. Kitamaru and S. Hizukuri, *Fukui Kogyo Koto Senmon Gakko Kenkyu Kyo*, **21**, 41, (1987), in Japanese.

Light Scattering from Polymer Blend Solutions. 6. Temperature Dependence of Interaction Parameter, T. Fukuda, M. Nagata, H. Miyashita and H. Inagaki, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 67, (1987).

On the Estimate of the Size and the Optical Anisotropy of Polyethylene Crystals Growing in Dilute Solution, H. Suzuki and Y. Muraoka, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 83, (1987).

Effect of Excess Charge in Cellulosic Polyelectrolyte Complexes on the Blood Compatibility, H. Ito, T. Miyamoto, H. Inagaki, H. Iwata and T. Matsuda, *J. Bioactive & Compatible Polym.*, **2**, 193, (1987).

Light Scattering from of Polymer Blend Solutions. 5. Characterization of Systems

of Relatively High Incompatibility, M. Nagata, T. Fukuda and H. Inagaki, *Macromolecules*, **20**, 2173, (1987).

Free-Radical Copolymerization, 6. New Interpretation for the Propagation Rate Versus Composition Curve, T. Fukuda, Y.-D., Ma and H. Inagaki, *Makromol. Chem. Rapid Commun.*, **8**, 495, (1987).

Role of Nonkeratinous Proteins in Crimp Formation of Wool Fibers by Draft and Immediate Relaxation, R. Umehara, Y. Shibata, Y. Masuda, H. Ito, T. Miyamoto and H. Inagaki, *Text. Res. J.*, **58**, 22, (1988).

Light Scattering Characterization of Polymer Blends in Solution, T. Fukuda and H. Inagaki, "Integration of Fundamental Polymer Science and Technology" P. J. Lemstra and L. A. Kleintjens, eds., Elsevier Applied Science, England, **2**, 210, (1988).

<sup>13</sup>C-NMR Studies of Some Cellulose Derivatives, T. Miyamoto, T. Fujimoto, S. Takahashi, T. Yamagishi, O. Hasegawa and H. Inagaki, "Wood and Cellulosics" ed. by J. F. Kennedy et al., Ellis Horwood Publ. Chapter 66, 597, (1987).

Functionalization of Cellulose: Recent Trends [I], T. Miyamoto and T. Yamagishi, Paper & Its Surrounding Hi-Technology, **3**, 33, (1988), in Japanese.

Functionalization of Cellulose: Recent Trends [II], T. Miyamoto and T. Yamagishi, Paper & Its Surrounding Hi-Technology, **3**, 34, (1988), in Japanese.

Artificial Crimping of Wool Fibers by Draft/Relaxation Process III. Effect of Combination with Shrinkingproofing Process. R. Umehara, Y. Shibata, Y. Masuda, H. Ito, T. Miyamoto and H. Inagaki, *Sen-i Gakkaishi*, **43**, 444, (1987).

TEM Observation of the Smectite-to-Palygorskite Transition in Deep Pacific Sediments, K. Tazaki, W. S. Fyfe, M. Tsuji and K. Katayama, *Applied Clay Sci.*, **2**, 233, (1987).

The Relationship Between the Microfibril Orientation in the Tracheid S<sub>2</sub> Layer and the Lignin Content of Coniferous Woods, S. Saka and M. Tsuji, *Cellulose Chem. Technol.*, **21**, 225, (1987).

Epitaxial Interfaces in Seme-Crystalline Polymers and Their Applications, J. Petermann, G. Broza, U. Rieck and A. Kawaguchi, *Journal of Materials Science*, **22**, 1477, (1987).

High-Resolution Electron Microscopy of Solution-Grown Crystals of Poly(p-phenylene sulphide), A. Uemura, M. Tsuji, A. Kawaguchi and K. Katayama, *J. Mater. Sci.*, **23**, 1506, (1988).

Phase Transition in Polymer Crystals, T. Itoh and S. Isoda, *Denshikenbikyo*, **23**, 77-86, (1988), in Japanese.

Polymers and High-Resolution Electron Microscopy, M. Tsuji, A. Uemura, M.

Ohara, S. Isoda, A. Kawaguchi and K. Katayama, *Ann. Rep. Res. Inst. Chem, Fibers, Japan*, **44**, 1, (1987), in Japanese.

## Biochemistry

Detection of Weak Sequence Homology of Proteins for Tertiary Structure Prediction, K. Nishikawa, H. Nakashima, M. Kanehisa and T. Ooi, *Protein Seq. Data Anal.*, **1**, 107–116, (1987).

Discriminant Analysis of Promoter Regions in Escherichia Coli Sequences, K. Nakata, M. Kanehisa and J. V. Maizel, Jr, *Comp. Appl. Biosci.*, **4**, 367–371, (1988).

A Multivariate Analysis Method for Discriminating Protein Secondary Structural Segments, M. Kanehisa, *Prot. Eng.*, **2**, 87–92, (1988).

Cluster Analysis of Amino Acid Indices for Prediction of Protein Structure and Function, K. Nakai, A. Kidera and M. Kanehisa, *Prot. Eng.*, **2**, 93–100, (1988).

Prediction of *In-Vivo* Modification Sites of Proteins from Their Primary Structures, K. Nakai and M. Kanehisa, *J. Biochem.*, **104**, 693–699, (1988).

Protein Structure Databases and Multivariate Data Analysis, M. Kanehisa, *Kagaku* (Chemistry), Suppl. **113**, 125–135, (1988), in Japanese.

Accessible Surface Area as a Measure of the Thermodynamic Parameters of Hydration of Peptides, T. Ooi, M. Oobatake, G. Némethy and H. A. Scheraga, *Proc. Natl. Acad. Sci. USA*, **84**, 3086–3090, (1987).

Molecular Dynamics Simulation of Infrared Spectra and Average Structure of Benzoic Acid Crystal, R. Nakamura, K. Machida, M. Oobatake and Hayashi, *Molecular Physics*, **64**, 215–227, (1988).

Effects of Hydrated Water on Protein Folding, T. Ooi and M. Oobatake, *J. Biochemistry*, **103**, 114–120, (1988).

Characteristic Thermodynamic Properties of Hydrated Water for 20 Amino Acid Residues in Globular Proteins, M. Oobatake and T. Ooi, *J. Biochemistry*, **104**, 433–439, (1988).

Intermolecular Interactions Between Protein and Other Molecules, T. Ooi and M. Oobatake, *J. Biochemistry*, **104**, 440–444, (1988).

Ionic Dynamics in Computer Simulated Molten LiNO<sub>3</sub> I. Translational and Reorientational Motion, T. Kata, K. Machida, M. Oobatake and S. Hayashi, *J. Chemical Physics*, **89**, 3211–3221, (1988).

Three- $\alpha$ -helical coiled-coil, as a Proposed Model for a Thin Rod Segment of Bacteriophage T3 Tail Fibers, S. Takahashi and T. Ooi, *Biochem. Biophys. Res. Com-*

*mun.*, **150**, 1244–1250, (1988).

Chain Reversals in Model Peptides: Studies of Cystine-Containing Cyclic Peptides, P. J. Milburn, Y. C. Meinwald, S. Takahashi, T. Ooi, and H. A. Scheraga, *Int. J. Peptide Protein Res.*, **31**, 311–321, (1988).

Synthesis of  $\alpha$ -Helices Having a Positively Charged Random Coil-Block on Either N- or C-Terminal, S. Takahashi, T. Hibino and S. Sawada, *Bull. Chem. Soc. Jpn.*, **61**, 2467–2471, (1988).

Temperature-Jump Apparatus and Measuring System for Synchrotron Solution X-Ray Scattering Experiments, Y. Hiragi, H. Nakatani, K. Kajiwara, H. Inoue, Y. Sano and M. Kataoka, *Review of Scientific Instruments*, **59**, 64–66, (1988).

Micellar Structure of  $\beta$ -Casein Observed by Small-Angle X-Ray Scattering, K. Kajiwara, R. Niki, H. Urakawa, Y. Hiragi, N. Donkai and M. Nagura, *Biochimica Biophysica Acta*, **955**, 128–134, (1988).

Microsegregated Structure in the Regenerated Silk Fibroin Film from *Bombyx Mori*, M. Nagura, T. Ueki, Y. Hiragi, H. Tagawa, M. Kataoka, Y. Izumi, Y. Muroga and Y. Amemiya, *Journal of Polymer Science, Pt. B: Polymer Physics*, **25**, 2567–2571, (1988).

Structural Characteristic of Poly(vinylacetate) Microgel in Solution, D. Nerger, K. Kajiwara, H. Urakawa and Y. Hiragi, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 97–108, (1988).

EXAFS Study of Selenocysteine Structure, Y. Hiragi, H. Maeda, T. Murata, K. Kajiwara, H. Sakurai, N. Esaki, H. Tanaka and K. Soda, *Photon Factory Activity Report*, **5**, 248, (1987).

Small-Angle Scattering from Polymer Solutions Using Synchrotron Radiation, H. Tagawa, H. Aoki, T. Ichimura, K. Kurita, T. Ueki, Y. Hiragi, Y. Izumi, M. Kataoka, Y. Muroga and Y. Amemiya, *Photon Factory Activity Report*, **5**, 251, (1987).

Aggregation Process of  $\beta$ -Casein, K. Kajiwara, R. Niki, H. Urakawa, Y. Hiragi, N. Donkai, and M. Nagura, *Photon Factory Activity Report*, **5**, 253, (1987).

Small-Angle X-ray Scattering Study of Higher-Order Structures of Chromatin in Solution, Y. Inoko, S. Fujiwara, M. Inada, T. Ueki, Y. Hiragi, M. Kataoka and Y. Amemiya, *Photon Factory Activity Report*, **5**, 254, (1987).

X-ray Solution Scattering Studies on Solubilized Bacteriorhodopsin II, M. Kataoka, M. Nakasako, F. Tokunaga, T. Ueki, Y. Hiragi and Y. Amemiya, *Photon Factory Activity Report*, **5**, 255, (1987).

Microsegregated Structure in the Silk Fibroin from *Bombix mori*, M. Nagura, Y. Hiragi, K. Kajiwara, H. Tagawa and M. Tsukada, *Photon Factory Activity Report*, **5**, 256, (1987).

Structural Studies on Aldolase by Means of Time-Resolved X-ray Scattering, M. Sato, Y. Kato, N. Tanaka, Y. Katsube, T. Ueki, M. Kataoka, Y. Hiragi and Y. Amemiya, *Photon Factory Activity Report*, **5**, 257, (1987).

Lyotropic Mesophase of Imogolite Observed by Small-Angle X-ray Scattering, K. Kajiwara, N. Donkai, H. Urakawa, Y. Hiragi, A. Kawaguchi and M. Nagura, *Photon Factory Activity Report*, **5**, 258, (1987).

Effects of Ionic Strength, Temperature and the Coenzyme on the Quarternary Structure and Activity of Tryptophanase, Y. Hiragi, T. Oda, M. Tokushige, K. Kajiwara, Y. Sano, E. Kim, T. Ueki and M. Kataoka, *Photon Factory Activity Report*, **5**, 259, (1987).

The Structure of P2 Myelin Protein in the Solution, M. Kimura, N. Masaki, K. Uemura, Y. Hiragi, K. Kajiwara and H. Urakawa, *Photon Factory Activity Report*, **5**, 260, (1987).

Small-Angle X-ray Scattering Study of Aggregation Process of Cucumber Green Mottle Mosaic Virus Protein, Y. Sano, H. Inoue, Y. Hiragi, K. Kajiwara, H. Urakawa, T. Ueki and M. Kataoka, *Photon Factory Activity Report*, **5**, 262, (1987).

Micelle Structure of Polyethylene Glycol Monoether Liquid Crystal, H. Urakawa, K. Kajiwara, Y. Hiragi, N. Donkai, W. Richtering and W. Burchard, *Photon Factory Activity Report*, **5**, 264, (1987).

The Effect of L-Lysine- $\alpha$ -oxidase from *Trichoderma Harzianum* rifai and *Trichoderma viride* on the in vitro DNA and RNA synthesis in Tumor cells, S. Kh. Khaduev, O. S. Zhukova, Ya. V. Dodrynin, K. Soda and T. T. Berezov, *Bull. Exp. Biol. Med.*, **4**, 459-460, (1987).

Separation and Analysis (24)Selenocysteine, N. Esaki and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 148-149, (1987).

Preparative Methods (43)Selenocysteine, H. Tanaka and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 240-243, (1987).

Selenodjenkolic Acid, H. Tanaka and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 243-244, (1987).

*Te*-Phenyltellurohomocysteine and *Te*-Phenyltellurocysteine, N. Esaki and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 245, (1987).

Preparation of Sulfur and Selenium Amino Acids with Microbial Pyridoxal Phosphate Enzymes, N. Esaki and K. Soda, "Methods in Enzymol." (W. B. Jakoby

and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 291–297, (1987).

Selenocysteine  $\beta$ -Lyase (Porcine), N. Esaki and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 415–418, (1987).

Microbial Sulfur Amino Acids: An Overview, K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 453–459, (1987).

L-Methionine  $\gamma$ -Lyase from *Pseudomonas putida* and *Aeromonas*, N. Esaki and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 459–465, (1987).

Selenocysteine  $\beta$ -Lyase from *Citrobacter freundii*, N. Esaki and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 493–496, (1987).

$\omega$ -Amino Acid-Pyruvate Aminotransferase, K. Yonaha, S. Toyama and K. Soda, "Methods in Enzymol." (W. B. Jakoby and O. W. Griffith, Eds.), Academic Press Inc., Orlando, **143**, 500–504, (1987).

Application of Free Enzymes in Pharmaceutical and Chemical Industries, K. Soda and K. Yonaha, "Biotechnology" (H.-J. Rehm and G. Reed, Eds.), VCH Verlagsgesellschaft, Weinheim, **7a**, 605–652, (1987).

A Spectrophotometric Rate Assay of Aminoacylase, H. Y. Cho, K. Tanizawa, H. Tanaka and K. Soda, *Anal. Biochem.*, **165**, 142–146, (1987).

Thermostable Aminoacylase from *Bacillus thermoglucosidius*: Purification and Characterization, H.-Y. Cho, K. Tanizawa, H. Tanaka and K. Soda, *Agric. Biol. Chem.*, **51**, 2793–2800, (1987).

Biochemistry of Physiologically Active Selenium Compounds, K. Soda, H. Tanaka and N. Esaki, "The Chemistry of Organic and Tellurium Compounds" (S. Patai, Ed.), John Wiley & Sons Inc., Chichester, **2**, 349–365, (1987).

Catalytic Action of L-Methionine  $\gamma$ -Lyase on 4-Azaleucine, S. Furuyoshi, T. Nakayama, N. Esaki, H. Takada, H. Tanaka and K. Soda, *Agric. Biol. Chem.*, **51**, 3159–3160, (1987).

Isolation and Characterization of Manganese-containing Superoxide Dismutase from *Gluconobacter cerinus*, K. Tsukuda, T. Kido, S. Ueda, M. Terakawa, Y. Shimasue and K. Soda, *Agric. Biol. Chem.*, **51**, 3323–3329, (1987).

A Spectrophotometric Method for the Determination of  $\gamma$ -Glutamyl Cyclotransferase with Alanine Dehydrogenase in the Presence of Anthglutin, T. Takahashi, T. Kondo, H. Ohno, S. Minato, T. Ohshima, S. Mikuni, K. Soda and N. Taniguchi, *Biochem. Med. Metabol. Biol.*, **38**, 311–316, (1987).

Leucine Dehydrogenase of a Thermophilic Anaerobe, *Clostridium thermoacetum*: Gene Cloning, Purification and Characterization, H. Shimoi, S. Nagata, N. Esaki, H. Tanaka and K. Soda, *Agric. Biol. Chem.*, **51**, 3375–3381, (1987).

Microbial Production of D-Valine from Racemic  $\alpha$ -Aminoisovaleronitrile, N. Nakajima, K. Tanizawa, H. Tanaka and K. Soda, *Bull. Inst. Chem. Res., Kyoto Univ.*, **65**, 141–143, (1987).

D-Amino Acid Aminotransferase from a Thermophile, *Bacillus* sp. YM-1: Enzymological Properties, Cloning of the Gene, and the Amino Acid Sequence, K. Tanizawa, Y. Masu, S. Asano, H. Tanaka and K. Soda, "Biochemistry of Vitamin B<sub>6</sub>" (T. Korpela and P. Christen, Eds.), Birkhauser Verlag, Basel, 43–46, (1987).

Diaminopropionate Ammonia-Lyase of *Salmonella typhimurium*, T. Nagata, T. Satoda, K. Tanizawa and H. Yamada, "Biochemistry of Vitamin B<sub>6</sub>" (T. Korpela and P. Christen, Eds.), Birkhauser Verlag, Basel, 229–232, (1987).

L-Methionine  $\gamma$ -Lyase: Its Essential Cysteine Residues, N. Esaki, T. Nakayama, H. Tanaka and K. Soda, "Biochemistry of Vitamin B<sub>6</sub>" (T. Korpela and P. Christen, Eds.), Birkhauser Verlag, Basel, 225–228, (1987).

Inactivation of Bacterial  $\omega$ -Amino Acid: Pyruvate Transaminase with *Se*-Hypotaurine, K. Yonaha, T. Sadeh, H. Tanaka and K. Soda, "Biochemistry of Vitamin B<sub>6</sub>" (T. Korpela and P. Christen, Eds.), Birkhauser Verlag, Basel, 329–332, (1987).

Enantiomer Synthesis of Amino Acids with Pyridoxal Enzymes, K. Soda, K. Tanizawa, N. Esaki and H. Tanaka, "Biochemistry of Vitamin B<sub>6</sub>" (T. Korpela and P. Christen, Eds.), Birkhauser Verlag, Basel, 435–443, (1987).

Industrial Production of L-Tryptophan from Indole and DL-Serine with Two PLP-Dependent Enzymes, N. Makiguchi, N. Fukuhara, N. Shimada, Y. Asai, T. Nakamura, and K. Soda, "Biochemistry of Vitamin B<sub>6</sub>" (T. Korpela and P. Christen, Eds.), Birkhauser Verlag, Basel, 457–460, (1987).

X-ray Crystallographic Studies of the Alanine-specific Racemase from *Bacillus stearothermophilus*, D. J. Neidhart, M. D. Distefano, K. Tanizawa, K. Soda, C. T. Walsh and G. A. Petsko, *J. Biol. Chem.*, **262**, 15323–15326, (1987).

Preliminary X-ray Data for a D-Amino Acid Amino-transferase from a Novel Thermophilic *Bacillus*, B. Stoddard, L. Howell, K. Soda, K. Tanizawa, D. Ringe and G. A. Petsko, *J. Mol. Biol.*, **196**, 441–442, (1987).

A Novel Pyridoxal 5'-Phosphate Enzyme, D-Selenocystine  $\alpha$ ,  $\beta$ -Lyase, N. Esaki, V. Seraneeparkarn, H. Tanaka and K. Soda, *Sulfur Amino Acids*, **10**, 329–332, (1987), in Japanese.

Enzymatic Synthesis of Optically Active Amino Acids from Racemic Starting



Materials, K. Soda and H. Tanaka, *Biotechnology*, **1**, 93–99, (1987).

A New Inhibitor of Alanine Racemase, H. Takada and H. Tanaka, *Vitamin*, **62**, 48–49, (1988), in Japanese.

Bacterial Aspartate Aminotransferase: Its Occurrence in Thermophilic Bacteria, and the Isolation and Identification of New Thermophiles, M.-H. Sung, K. Tanizawa, Y. Masu, H. Tanaka and K. Soda, *Agric Biol. Chem.*, **52**, 269–270, (1988).

Chemical Modification of Cysteine Residues of L-Methionine  $\gamma$ -Lyase, T. Nakayama, N. Esaki, H. Tanaka and K. Soda, *Agric Biol. Chem.*, **52**, 177–183, (1988).

Separation Techniques in Biotechnology, O. Toshihisa and K. Soda, *Handbook of Bioseparation Technology*, (I. Endo, H. Oya, K. Soda, T. Hashimoto, Eds.) Science Forum, Tokyo, **1**, 22–25, (1988), in Japanese.

Enzymes, O. Toshihisa and K. Soda, *Handbook of Bioseparation Technology*, (I. Endo, H. Oya, K. Soda, T. Hashimoto, Eds.) Science Forum, Tokyo, **1**, 376–386, (1988).

Specific Labeling of the Essential Cysteine Residue of L-Methionine  $\gamma$ -Lyase with a Cofactor Analogue, *N*-(Bromoacetyl)pyridoxamine Phosphate, T. Nakayama, N. Esaki, H. Tanaka and K. Soda, *Biochemistry*, **27**, 1587–1591, (1988).

Thermostable Alanine Racemase from *Bacillus stearothermophilus*: DNA and Protein Sequence Determination and Secondary Structure Prediction, K. Tanizawa, A. Ohshima, A. Scheidegger, K. Inagaki, H. Tanaka and K. Soda, *Biochemistry*, **27**, 1311–1316, (1988).

Purification and Characterization of *Clostridium sticklandii* D-Selenocystine  $\alpha$ ,  $\beta$ -Lyase, N. Esaki, V. Seraneeprakarn, H. Tanaka and K. Soda, *J. Bacteriol.*, **170**, 751–756, (1988).

Thermostable Dipeptidase from *Bacillus stearothermophilus*: Its Purification, Characterization, and Comparison with Aminoacylase, H.-Y. Cho, K. Tanizawa, H. Tanaka and K. Soda, *J. Biochem.*, **103**, 622–628, (1988).

Biochemistry of Selenium Amino Acids, K. Soda, H. Tanaka and N. Esaki, *Trace Nutrients Res.*, **4**, 1–5, (1988).

D-Selenocystine  $\alpha$ ,  $\beta$ -Lyase of *Clostridium Sticklandii*, N. Esaki, V. Seraneeprakarn, H. Tanaka and K. Soda, *Trace Nutrients Res.*, **4**, 87–91, (1988).

Pyridoxal 5'-Phosphate-Independent Amino Acid Racemase, N. Nakajima and K. Soda, *Kagaku*, **43**, 212–213, (1988), in Japanese.

Amino Acid Racemases—Their Enzymological Properties and Application—, K. Tanizawa and K. Soda, *Hakkou to Kougyo*, **46**, 166–178, (1988), in Japanese.

Supercoiling Response of *E. coli* Promoters with Different Spacer Lengths, T. Aoyama and M. Takanami, *Biochimica et Biophysica Acta*, **949**, 311–317, (1988).

Organization and Characterization of the *virCD* Genes from *Agrobacterium Rhizogenes*, T. Hirayama, T. Muranaka, H. Ohkawa and A. Oka, *Molecular and General Genetics*, **213**, 229–237, (1988).

Structural Features of the Carboxy Terminus of p60<sup>c-src</sup> That are Required for the Regulation of its Intrinsic Kinase Activity, J. Kato, Y. Hirota, N. Nakamura, N. Nakamura and T. Takeya, *J. Jpn. Cancer Res.*, **78**, 32–40, (1987).

Substitution of Ser-17 of pp60<sup>c-src</sup>: Biological and Biochemical Characterization in CEF, Y. Hirota, J. Kato and T. Takeya, *Mol. Cell. Biol.*, **8**, 1826–1830, (1988).

Enzymes Used In Genetic Engineering, K. Kita and T. Takeya, *Journal of Clinical Science*, **24**, 398–404, (1988).